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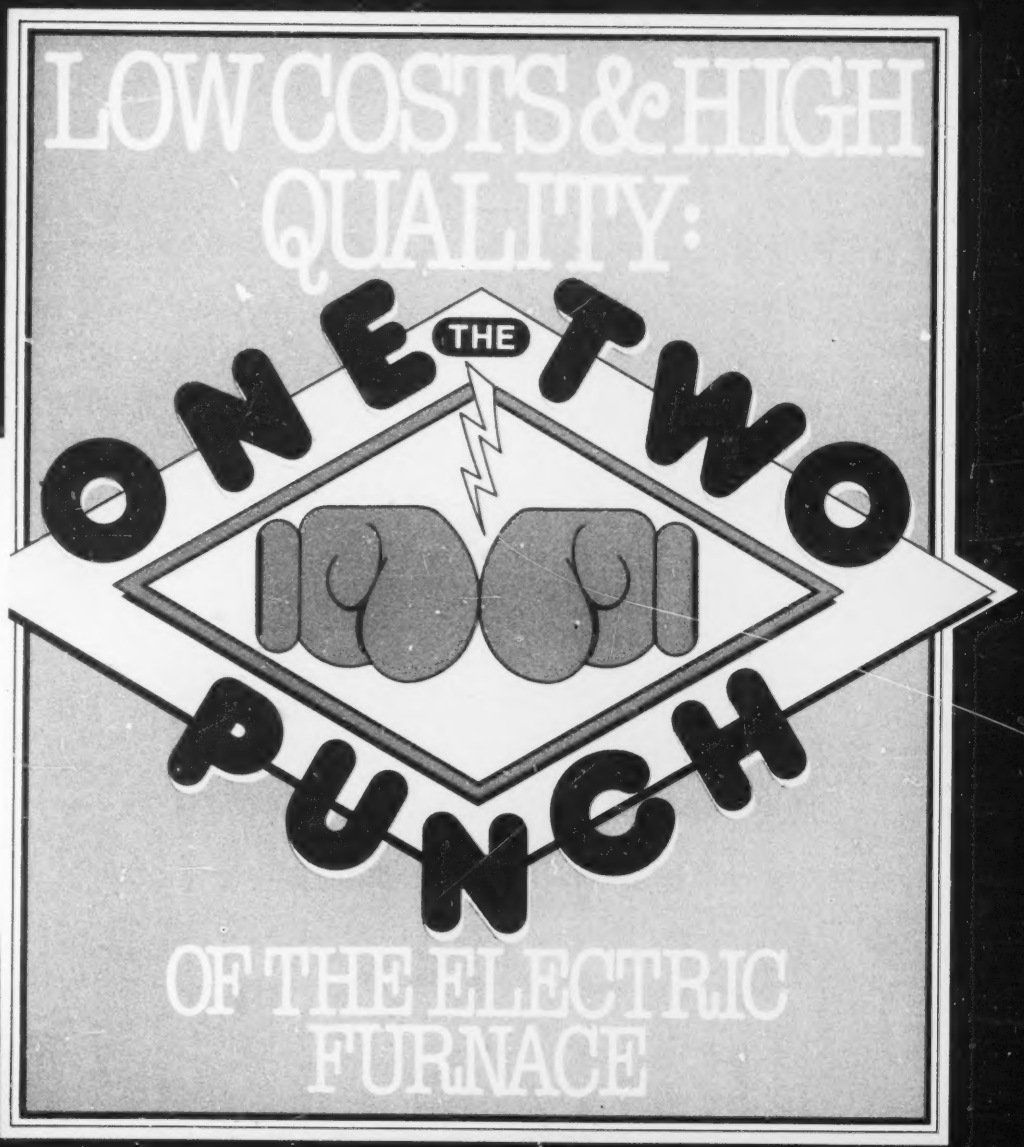
THE MAGAZINE FOR METAL PRODUCING MANAGEMENT

JANUARY 3, 198



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STEEL'S ENERGY BATTLE:
STILL OPPORTUNITIES FOR MORE SAVINGS

CENTRIFUGAL CASTING OF HIGH CHROME ROLLS
WINNING CONVERTS IN THE U.S.

ANNUAL METALWORKING FORECAST:
A FROZEN ECONOMY BEGINS TO THAW

VOL. 226, NO. 1

IRON AGE

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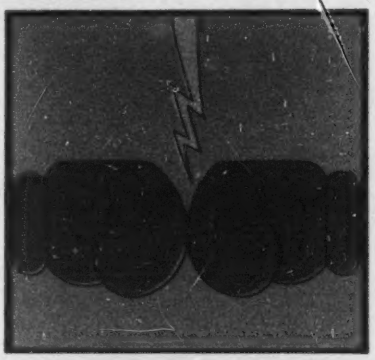

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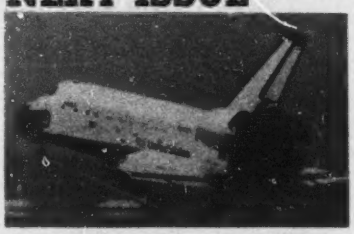


How metal matrix composites keep the Shuttle flying.

IRON AGE (ISSN 0164-5137) is published 36 times a year with a frequency of every 10 days appearing on a Monday-Wednesday-Friday cycle of every month by CHILTON COMPANY, Chilton Way, Radnor, PA 19089. Chilton Co. is a division of American Broadcasting Companies, Inc., New York, N.Y. Second Class Postage Paid at Wayne, PA 19087 and additional mailing offices. IRON AGE is sent on a controlled free basis to qualified managers in U.S. metalworking companies. Non-metalworking companies, services, government, institutions, schools and colleges, $55 one year. Canada, $55 year. Foreign, $65 one year. Single copies, $2.50. Cable Chilton, Philadelphia.
Send address changes to IRON AGE, P.O. Box 2040, Radnor, PA 19089

ANNUAL FORECAST ISSUE

THE FROZEN ECONOMY BEGINS ITS THAW

A faint light started to break over a darkened economic horizon as 1982 came to a close.

That glow was sparked by hopeful signs in a long fight against a long recession.

And the signs were bright enough to encourage forecasters, almost to a man, to predict recovery for the U.S. economy this year.

The envisioned recovery is a very moderate one. The consensus forecast for growth, as measured by inflation-adjusted Gross National Product, comes to between 2.5 pct and 3 pct for the year.

It may be a modest enough recovery, but in view of what a downer 1982 turned out to be, 1983 may seem robust by comparison. Still, the very moderation of the perceived recovery means that some elements of the economy will share little, or not at all, in it this year. Of significance to metalworking industries, one of those bypassed elements is almost certain to be business investment in new plant and equipment.

Last year was not a year for metalworking industries. This year will be better, but it almost certainly won't be a banner one. To a great degree, as the health of capital spending goes, so goes the health of metalworking.

As for the overall outlook, *Iron Age* finds itself about in line with 'the crowd.' As noted on the chart here, a GNP growth of 2.9 pct is forecast. This growth

rate is about one-half the rate following the other big post-war recession of 1973-75.

Of course, a moderate recovery may be just what the doctor ordered. The economy is, after all, still reeling from a hang-over following one of the worst inflation binges in the nation's history. The recovery just could not be explosive without inflation taking off in a mad spiral again.

So, what are the bright signs that are causing that glow on the horizon? Why recovery in 1983?

For one, there are fundamentalists who see in the sheer length of the current recession good reason for a turnaround. It is 17 months old this month. And that is the longest for any recession since the days of the Great Depression of the 30's.

Probably of greater pertinence, in terms of a force for recovery, is the recent dramatic decline in inflation rates. Price-cooling is something that has demonstrably triggered business recoveries.

As 1982 closed, prices for consumer products and services were running at about a 5 pct annual rise rate. That was down from almost 12 pct in 1980 and down from 7 pct in 1981.

And prices paid at the industry wholesale level for goods and services were running at less than 5 pct at year-end 1982. That followed yearly rates of 12.4 pct and 9 pct.

More than just a sharp drop in inflation rates, there has been a very significant cooling in the traditional volcanic areas of price pressures. The key volatile price elements—energy, food and housing—have been, and are being, substantively reduced. They are simply fading as a prime inflation threat. And, collectively, that is something new to happen in such a cyclical setting.

Too, the core rate of inflation—worker wages and benefits—has been turned back sharply, and much more so than in past similar cyclical phases.

Another reason for expecting recovery this year centers on a shift that warms the heart of all in metalworking. Interest rates are down. The prime rate, for example, near year-end, was around 11 pct, and weakening. The rate in 1981 averaged nearly 19 pct.

Just a few weeks ago, the two economists known as Dr. Death and Dr. Doom—who have often correctly called the turn on interest rates—played happier tunes on their pipes than for a long, long time.

Henry Kaufman (Dr. Doom), chief economist for the investment firm of Salomon Brothers Inc., and Albert M. Wojnilower (Dr. Death), chief economist at First Boston Corp., another investment house, both predicted further declines in short-term interest rates.

These analysts based their latest forecasts on the prospects for recovery moderate enough not to put severe strains on credit markets as Goliath government raided those same markets.

Too, both experts see continued easing of Federal Reserve Board policies on money supply and further lowering of the discount rate—the interest rate the Fed charges member banks that borrow from it.

In short, these seers, and others, perceive a new mellow mood on the part of the Fed. They see the central bank swinging from grim inflation fighting to trying to put some zip in the economy.

The Fed has been able to shift into its new stimulative role because the great slack in the economy precludes chances of inflation being reignited. Some 11 pct of the workforce is idle, as well as about one-third of the nation's production capacity.

And, finally, it is on the square marked 'consumer' where most of the blue chips have been placed in betting on recovery this year. Paraphrasing a biblical tale, one economist says

it is the consumer who "must lead us out of the wilderness."

And it looks like this hero of past recoveries can come through again. The consumer has upped his savings sharply, trimmed back his borrowing and had an improvement in his real income as inflation cooled. Too, a mid-year 1983 10 pct tax cut won't hurt.

The far 'frontier' of consumer sentiment and spending is known to be the housing market. And action is finally coming on that long-inactive front. Fred Napolitano, president of the National Assn. of Home Builders, last month predicted a 30 pct increase in new home sales for 1983.

"There's been a turnaround in all the key indicators in recent months," he said. "Mortgage interest rates have plummeted from 18 to 12 pct levels, while housing starts, building permits and home sales have shown some signs of life and are heading in the right direction for the first time in three years."

It is falling interest rates that are performing most of the still-modest magic throughout the consumer sector. In addition to the housing evidence, the temporary special low rates offered by auto companies in late 1982 worked wonders in clearing out 1982 model-year leftovers. The clear-up was the best scored in 12 years.

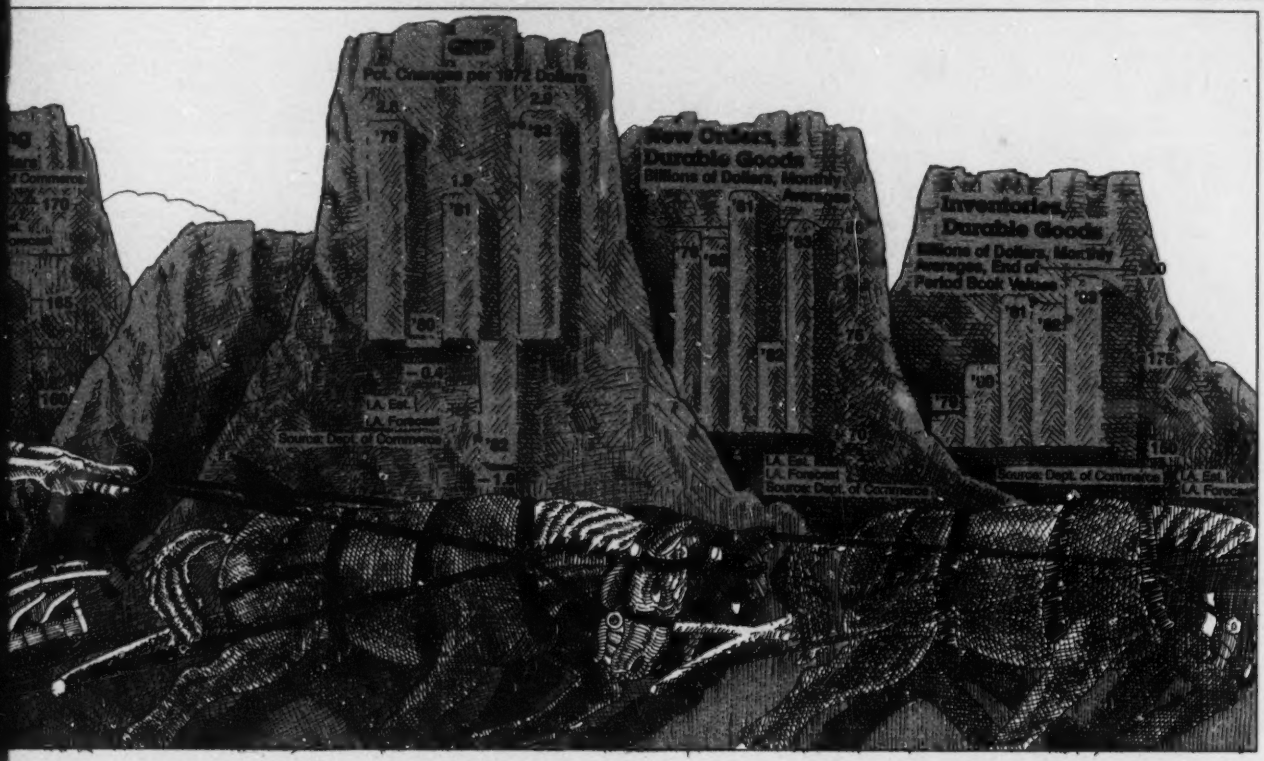
Despite some rays of sunshine, there is a long, dark shadow cast across the U.S. economic landscape as the year starts.

The shadow doesn't come from the high unemployment rate. High unemployment may be "tragic" as President Reagan says, and it may be heart-breaking. But it is **not** a leading economic indicator. It is misery that points to misery that went before.

It is huge Federal government budget deficits that cast the long, dark shadow.

Even top economists within the Administration state flatly that monstrous and still-swelling deficits could well abort economic recovery. Martin Feldstein, chairman of the Presi-

ANNUAL FORECAST


GNP
Pct. Changes per 1972 Dollars
New Orders, Durable Goods
Billions of Dollars, Monthly Averages
Inventories, Durable Goods
Billions of Dollars, Monthly Averages, End of Period Book Values
Source: Dept. of Commerce

dent's Council of Economic Advisers, told a Congressional committee last month, "I don't see how we can have a healthy economic recovery unless we have deficits coming down, and coming down substantially."

The budget deficit in fiscal year 1982 (ended October 31), amounted to $111 billion. Budget Director David A. Stockman forecasts that the deficit in the current fiscal year will be $185 billion. And, as for 1984 and 1985—well, he's looking for a flood of red ink rolling up to $190 and $200 billion each year.

The previous deficit record high came in 1976 and amounted to what is now a seemingly paltry $66 billion.

If Washington does nothing about cutting down the deficit, there is the feeling that economic recovery could 'hit the wall.'

If Washington does get the deficit down, that can only happen through higher taxes and/or reduced government spending. And either of those actions would impact on recovery—in now unknown ways.

But it will probably be the years beyond 1983 that will be most effected by what is done in Washington this year. That's why, in sum, it looks like the modest recovery so widely forecast for this year is likely to hold its ground, monster deficit or not.

Still, recovery for the overall economy is one thing, and recovery for each and every sector of the economy is another.

As noted, the widely-forecast moderate recovery for 1983 won't have enough power to pull all elements of the economy up the hill with it. A likely 'orphan' in the recovery this year is business capital investment.

Always a laggard in any recovery, plant spending will likely be further behind this time than is usual. For one, it is deeper in the recession hole than the overall economy; its growth has been slower for longer. Also, two of the key determinants of plant spending—corporate profits and plant capacity usage—have been harder hit than usual by the recession.

On top of that, long-term interest rates have not come down anything like short-term rates. And it is long-term credit that underpins much of capital outlays. Corporations are now turning to long-term borrowing, but that is chiefly to pay off piled-up short-term debt, not to finance plant expenditures.

The mood and intentions of industry on plant spending are seen in the Conference Board's latest survey of capital appropriations by the 1000 largest manufacturing companies covering the third quarter last year. These appropriations fell to their lowest level since late 1978.

The board noted that, "The outlook for actual capital spending in 1983 is clearly subdued."

These findings are about in line with the U.S. Commerce Dept.'s latest survey (late October & November) of U.S. business executives on their own capital spending plans for the first half this year. The executives said they planned to cut their spending (inflation-adjusted) by 0.4 pct in the first quarter and by 0.2 pct in the second period. Remember, this follows a year when plant spending fell by about 5 pct.

Former Presidential adviser Alan Greenspan is gloomier on real plant outlays for this year; he sees a decline of about 7 pct.

The fortunes of metalworking industries usually move right along with business investment. And, clearly, that investment is not shaping up well at all for 1983.

So, recovery? Yes. For the U.S. economy. But it's going to be a longer wait for plant spending and the metalworking industries that depend on that investment.

But, of course, without any recovery this year for the economy, the wait for metalworking's recovery would be that much longer.

John Baxter

ANNUAL FORECAST

Steel

Steel shipments are expected to rise from 60 million tons in 1982 to 73 million tons in 1983.

If the forecasts are right, 1983 will be the second worst year since 1962. Last year was the worst in the memories of veteran steelmakers.

In looking ahead to 1983, about the only consolation for steel producers is that the forecasts are probably wrong. The chances of error are all on the upside.

However, steel producers are in no mood to anticipate pleasant surprises. Last year was a time of continuing disappointment. Until there is hard evidence of a significant improvement, steel people are going to plan on another bad year.

Approaching the year end, no improvement was in sight. If anything, the early orders for the first quarter of 1983 indicated a decline from the fourth quarter of 1982.

This picture could change. Operating with little or no backlog, the steel industry is offering short lead times. From 30 to 40 pct of the steel shipped is ordered in the month of delivery. An upturn could develop with little or no advance warning.

On paper, you can make a case for such an upturn. In 1982, users liquidated 10 million to 13 million tons of steel inventory. Steel producers reduced their own stocks by more than 3 million tons.

If the calculations are right, users should at least stabilize their steel inventories soon. That would boost steel shipments by a million tons a month. The forecasts assume this will happen. Nearly all the improvement predicted for 1983 is accounted for by the shift from inventory cutting to inventory stability.

It's entirely possible steel users will go from inventory cutting to inventory building. For the first time since 1971, users face the threat of a national steel strike. Steel labor contracts expire in August and there no longer is an arbitration agreement to prevent a strike.

The leverage of strike "hedge" buying was shown in 1971 steel labor negotiations. Steel shipments rose from about 6 million tons the previous November to nearly 10 million tons in June of 1971. That was during a recession.

There is certainly the potential for a market upheaval but, again, there is no disposition to count on one. Making for pessimism is the general weakness of the metalworking economy. Mill analysts look for this weakness to extend through 1983.

In the industrial sector, which accounts for two-thirds of steel consumption, further declines are predicted for heavy construction, machinery, railroad products, and oil and gas drilling.

Consumer markets are expected to begin turning upward. Modest gains are predicted for automotive, home building and appliances. These aren't expected to offset the industrial losses. Total consumption of steel is seen falling from about 87 million tons in 1982 to 86 million tons in 1983.

The consumption estimates show the extent of the metalworking depression. Not since 1964 has consumption been as low as 86 million tons. In 1975, which was considered a bad recession year, more than 95 million tons of steel were consumed.

With industrial activity so depressed, steel producers have to be bearish. Inventory estimates notwithstanding, people aren't going to buy more steel when they're using less steel. And there's no assurance the usage rate has hit bottom.

What's needed is an auto boom. The direct effect of the auto business is enormous. In the first half of 1980, the auto companies were building cars and building inventory. Steel shipments rose to 8.7 million tons in March. Supply tightened enough to bring general inventory building.

The market collapsed when auto plants pulled back in the second quarter of 1980, but the brief spurt showed the importance of this one market. A sustained auto boom now would mean immediate direct impact and would eventually revive the capital goods sector.

In this connection, it's worth noting that auto sales were up sharply in November. From an annual rate of 5.4 million in October, sales rose to a rate of 7.5 million in mid-November.

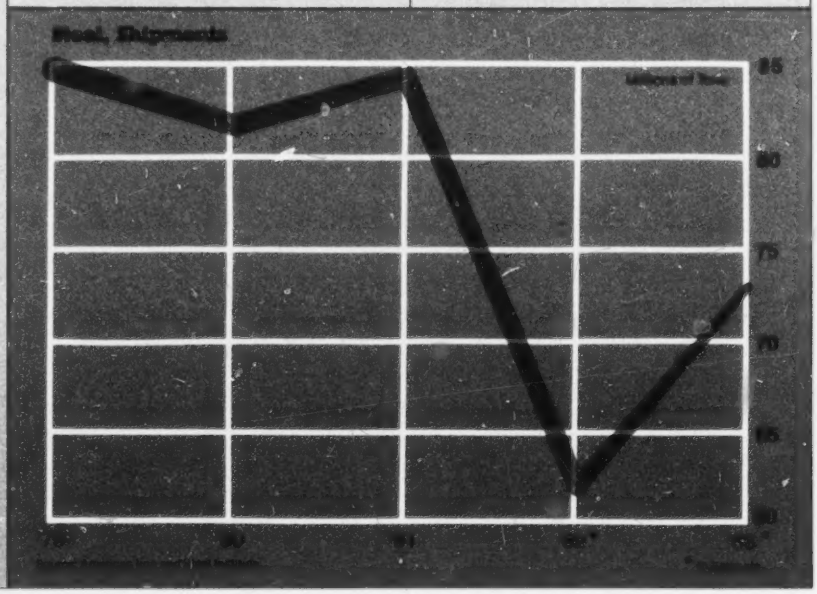
It's also worth noting that domestic steelmaking capacity is not known with great precision. In the past, domestic mill shipments have averaged over 9 million tons a month for sustained periods. For the last six months, shipments have averaged under 5 million tons a month. With furnaces and work forces pared down, the mills would probably have trouble gearing up to a sudden surge.

No one is very worried about this possibility. Foreign steel producers stand ready to offer almost unlimited quantities of metal. Until business improves, it's unlikely steel users will get excited about the strike threat or anything else.

A casualty of the recession is the steel modernization push. The steel industry spent nearly $3.4 billion on new plant and equipment in 1981. The industry came into 1982 with projects worth $7 billion.

When the market collapsed in the first half of 1982, many of the big projects were slowed, suspended or cancelled.

At best, there has been a costly delay in the modernization drive. The way it looks, a continuing financial squeeze will hold steel spending to a minimum in 1983.



Nonferrous

Some of the confidence within the nonferrous metals industries that business this year will be better than it was in 1982 can be interpreted as a conviction that nothing can be as bad as 1982 was for metals consumption, production, shipments and prices.

The rest of it can be assigned to the belief that the producers have done their part to position themselves for an upturn and the rest is up to such externals as interest rates and the ability of various segments of the consuming sector to get the ball rolling.

Metals production, be it aluminum, copper, nickel, molybdenum, zinc or lead was down sharply last year. The impact on producer inventories wasn't as dramatic as the production cuts—at least not immediately—because the industrial chew-up rate was on a parallel course. By year-end, however, the trend of inventory accumulation was reversing in some cases and slowing down in others.

Industrial consumers, meanwhile, exited 1982 the same way they entered it with inventories of production materials down to the bone and new purchases on a hand-to-mouth basis. Rock bottom metals prices, well below production costs in most cases, proved insufficient inducements to stock up, even as money rates receded in the latter part of the year because metals were not in short supply and there was no immediate threat of higher prices.

U.S. primary aluminum production last year was at a 14-year low, but the industry's inventory situation didn't improve anywhere near as rapidly as output dropped. Industry shipments were down about 9-10 pct and the general expectation is that volume in 1983 should be up anywhere from 10 to 12 pct. Top level executives are projecting a turning point somewhere toward midyear and a slow, but steady rate of recovery thereafter. That's not the sort of scenario that supports a firm rate of price recovery, particularly with industry stocks still a bit on the high side. But the producers entered 1983 with a tight rein on production still in force and they have been making noises about some idled primary capacity never coming back on stream because of prohibitive energy costs and market realities.

A big question mark for aluminum remains the international picture. Soviet bloc aluminum offerings have done their part in depressing free market prices and this metal (much of it still in London Metal Exchange warehouses toward the turn of the year) has to be moved through somebody's pipelines before the pressure is lifted.

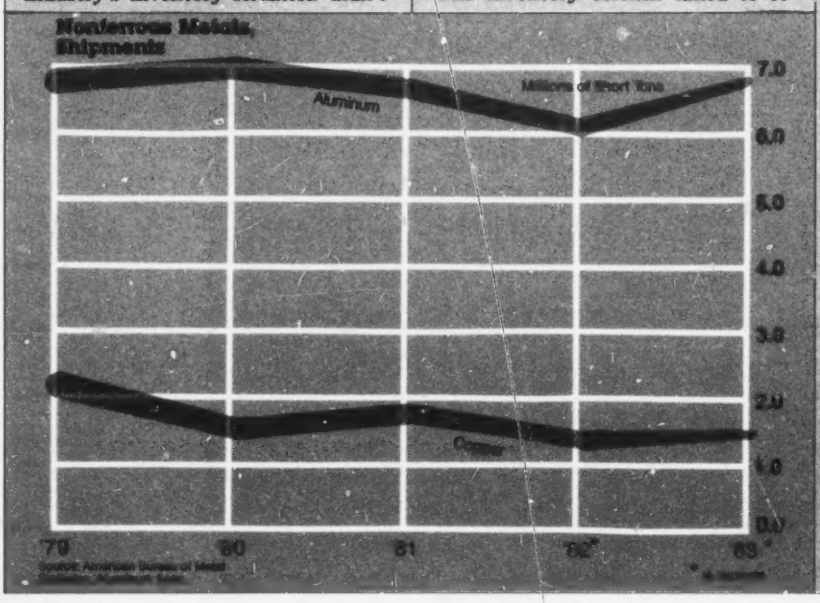
The U.S. aluminum industry has to renegotiate key wage pacts this spring but the industry's long history of labor peace usually moderates the pressure on buyers.

The copper producers also have to renegotiate their wage pacts by midyear and the copper industry usually settles up after a long strike. About the best that can be said for the severe production cutting in the copper sector during 1982 is that it kept prices from weakening further than they did. The inventory column failed to respond significantly and, toward the final months of the year, there was a nettlesome trend toward increase in copper stocks in L.M.E. and Comex warehouses while producers' inventories were largely static.

Copper consumers' stocks entered the year at minimum levels, however, which means there should be some inventory rebuilding toward the end of the first quarter—interest rates permitting. There were some faint signs of life in key consumer markets like automotive and residential construction toward the end of 1982, but it was far from robust. Copper imports were down last year, but overseas producers continued to be disinclined, for internal political and economic reasons, to slash production and there are no projections for a tightening supply of copper—for the first quarter, at least. Medium term possibilities include prospects for gradual improvement in copper consumption and a copper strike, all of which make second quarter copper sales and price projections something of a question mark.

Lead and zinc producers need a better automotive year to mark gains on a disappointing 1982. The lead companies also could use a cold winter to rebuild the replacement automotive battery market. The car companies generally expect this year will be noticeably better than 1982—again, interest rates permitting—but nobody in Detroit is talking about a boom year.

The capital goods market resides in Limbo while everyone waits for the consumer sector to reassert itself first. Which means another tough year for nickel and molybdenum. The nickel and molybdenum companies have their production schedules down about as far as they can go, which means at the minimum that inventories are being brought under some semblance of control, but revival of demand could still be some way off. The defense market started drifting under a cloud as 1982 drew to a close as Congress opened debate on the Reagan Administration's military budgets. This is an off-year as far as national elections are concerned, but the focus in Official Washington appears to be drifting toward the civilian sector—chiefly unemployment, Social Security benefits and interest policy, all of which have bearing on the purchasing power of the man on the street, who was supposed to lead the recovery last year and may be given a chance at it in 1983.



ANNUAL FORECAST

Auto

Automakers expect a slow, grudging recovery of sales in 1983. They hope to sell as many cars in 1983 as they did in 1980—6.6 million units. Less sanguine observers peg this year's total sales at 6.4 million units.

That's nowhere near the 8.3 million vehicles sold in 1979, the last of Detroit's boom years; but that's one million more than the 5.6 million total of 1982, the lowest tally since 1961.

The low-interest financing (10.9 pct) offered by automakers speeded sales during the final months of 1982. 1983 begins with a normal 60 to 70 days' worth of inventory in the dealer pipelines. Production this year, therefore, should be about the same as sales: 6.4 million.

If 1983 produces sales anywhere near these estimates, General Motors, Ford, and Chrysler each will make a profit. American Motors will edge near profitability, because its new Alliance will continue to sell well.

Volkswagen needs new products. It will introduce some in 1983, but these likely won't translate into an operating profit until 1984.

In 1982, only GM made an operating profit.

Capital spending by automakers peaked in 1981 and will continue at lower levels. After spending $9.7 billion in 1981 on plants, equipment, and tools, GM spent $7 billion in 1982. Capital spending for the entire auto industry will total $10-11 billion in 1983, according to one industry analyst.

Automakers are counting on a recovery in the U.S. economy to increase car sales. Spring traditionally sees a rise in sales, but Detroit expects the big surge to start in June.

"I think the annual sales rate," says a top auto industry executive, "has the potential of approaching 14 million cars and trucks by the end of the 1983 model year." That would mean an annual sales rate of more than 10 million cars by September. In contrast, the annual sales rate fell to 5 million in October 1982.

"I'm not making any forecasts," says another auto industry leader, "because we've been so wrong now for so many years.

"I can't believe we'd have another flat year in 1983. I think sales will be up, but I don't know how much.

Another industry executive predicts that sales in 1983 will rise by 10 to 15 pct over the total for 1982—from 5.6 million to between 6.2 million and 6.4 million vehicles.

Most analysts expect a continuation of sales incentives in the first quarter of 1983.

"Usually we expect 24 pct of our annual sales," says one analyst, "to occur in the first quarter; 28 pct in the second quarter; 24 pct at best in the third quarter; and 21 pct in the fourth. For 1983, take 2 percentage points off your usual first-quarter figure and add that to your usual fourth-quarter figure. Take one point off the second quarter and add that to the third quarter."

That would mean 1.408 million in the first quarter; 1.728 million in the second; 1.6 million in the third; and 1.664 million in the fourth quarter if sales are 6.4 million in 1983.

Machine Tools

The machine tool industry continues to limp along with lower order volumes than would have been thought possible. October of 1982 showed a small spike in new orders, but with the volumes so low, one or two decent orders could amount to a considerable percentage increase and still not indicate a trend. The year 1982 has been predicted to end with figures down anywhere from 30 pct to 50 pct from 1981. And 1983 doesn't look much better.

Many companies look for an upturn in order activity in the third or fourth quarter of 1983. All feel that it will be a slow recovery, but one which should last for two or three years when it finally gets started.

A problem for the machine tool industry is, of course, that equipment which requires a longer lead time will not even show up on '83's shipments reports. Actually, both shipments and orders in 1983 will reflect the '82 economy.

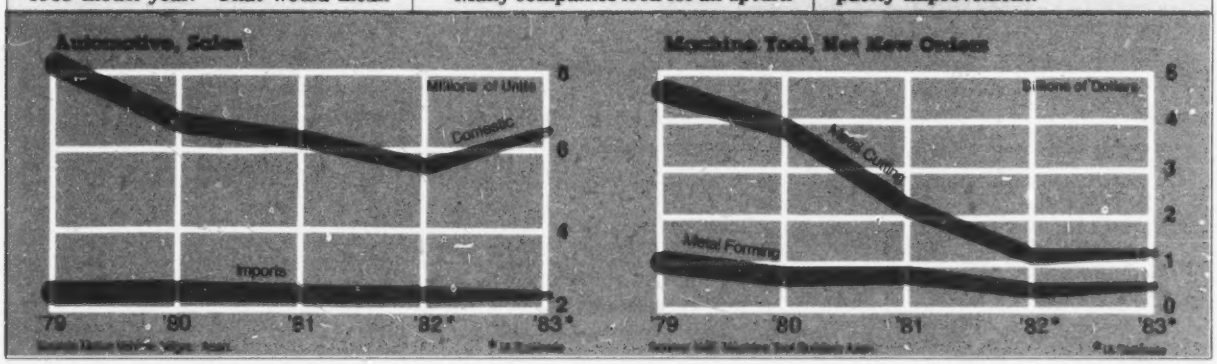
Another significant factor which will delay recovery for some machine tool companies is the backlog of Japanese machine tools in this country. Estimated by some to be 1½ years supply of smaller machining centers and lathes, these machine tools will be formidable competition—all the more so because of their immediate deliverability and heavy discounting. Some sources are predicting business failures among U.S. manufacturers that compete only in this market segment.

Current order activity is largely defense related, and defense will be the biggest single customer in '83. Defense orders were slower coming in than many hoped. There are definite commitments now, however. This could be the bright spot in 1983.

Energy, as a market, is very slow. Automotive has some programs in the works, not the volumes of the late '70s though.

Overall, the industry will not pick up substantially until an increase in consumer spending and housing triggers more capacity utilization in a variety of manufacturing industries.

When capital spending begins in earnest, the equipment most likely to head corporate shopping lists is the more sophisticated, numerically controlled machine tools. These tools have been recognized as tools to increase productivity. So, when companies have the luxury of buying new equipment, they will look for productivity improvement more than for capacity improvement.



ANNUAL FORECAST

Instruments & Controls

Instrumentation in the metalworking industries is always something of a mixed bag. Some segments are more sensitive to the economic situation than others.

Process control, for example, was down in 1982 about 7 pct from the year before; and it is not expected to pick up in 1983. An increase in order activity could begin toward the end of the year if the general economy turns before May or June of 1983, but nobody's really optimistic about that.

On the other hand, the test and measurement market was up in 1982 by 8 or 9 pct, and it should match that growth or do better next year. This is because these groups of control technology are directed toward the electronics industries and the semiconductor industries which are turning out more products and which, therefore, need more equipment.

Also, military communications and control continues to need products. If defense spending increases as is expected this sector will become even stronger.

Communications in general is a growing market. As distributed control, electronic mail, computer networks of all kinds spring up, a lot of data is being sent from one location to another. Some is transmitted over phone lines; some is hard wired. Satellites are playing a stronger role.

These communications systems require test equipment. That has been a nice little market, says one authority. Local area networks, for example, are expected to grow at a compound rate of 28.6 pct for the next six years, and they represent just one segment of this communications explosion.

The increasing dependence on microprocessors spurs sales of logic analyzers and microprocessor development systems. All these things add up.

Other than these areas, however, the outlook is pretty bleak. Growth in 1983 should be about 2 pct over 1982, bringing shipments to just over $20 billion.

Many user industries had started to upgrade facilities before the economic slump worsened. And many had plans to do more retrofit. However, when business dropped, these companies closed inefficient plants rather than remodel them. And a lot of control orders died in those plants.

Exports in control instrumentation remained fairly constant in 1982 over the previous year because the test and measurement group was strong. In the export area, process control instrumentation was down 9 pct, analytical instruments down 4 or 5 pct.

The dollar is starting to weaken, however, and exports may be better in 1983 if the dollar weakens a bit more over the next six months and stays there. Exports usually run about 25 to 30 pct of total shipments.

Computers

The recession has affected the growth of the computer industry shipments in 1982, not just domestically but worldwide. And 1983 is one big question mark.

Some sources believe the domestic economy will pick up around the middle of the coming year and that should bolster shipment figures. But the economies of Europe don't seem close to a turnaround, and the foreign market accounts for about 30 pct of the U.S. computer industry business.

In other words, even with a stronger domestic economy, 1983 will not be a great year for the computer industry.

Shipments will be up in 1983 to almost $40 billion dollars, a growth of about 14 pct. But for an industry that expects the higher percentages it has become used to, 13 or 14 pct is a slow year.

The bright spots are the personal computers and the 32-bit minicomputers. And that should continue to be the picture for the next year.

In general the minicomputer industry is flat because of the lack of OEM activity. Even the market leaders in this segment have had less than historic growth in revenues and earnings this past year. The superminis, however, seem to be growing and their growth is expected to continue.

Personal computers are strong because of their low cost and because of the wide range of software now available. A few years ago software was lacking. Now, however, with two years of experience with the small businessmen and the educational sector, both the manufacturers and the independent software houses have developed numerous packages.

That seems to have stimulated a fairly substantial rate of growth in that end of the market, according to one source.

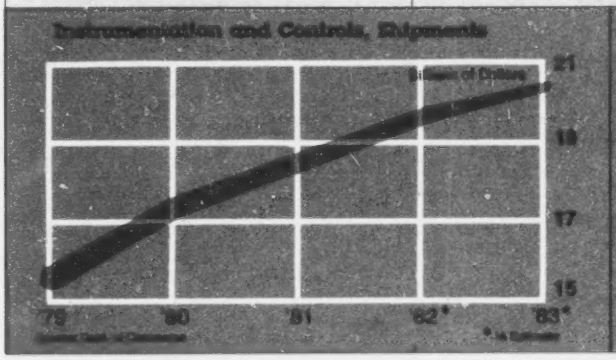
Growth in this market segment may be stimulated further by Japanese entries. If they succeed in dropping the price of personal computers as they have in other technological developments, the home consumer market could explode.

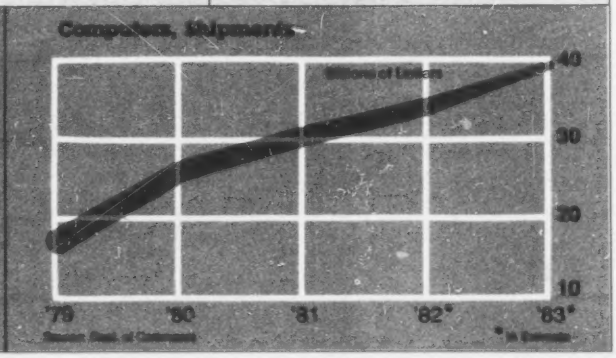
What has slowed the Japanese entry so far has been the lack of expertise in applications software and lack of distribution channels.

Another indication of the state of the computer industry is the layoffs which have been required by many companies this year. Layoffs are not common in this area.

Still, there is growth, and growth will continue over at least the next five years. One source predicts a compound growth rate of more than 16 pct over the 1981-1986 period, more than doubling in value from $29 billion in 1981 to $62 billion in 1986.

By 1986, this source says "desktop computers will account for 29 pct of the value of all worldwide computer shipments, second only to general purpose computers which will hold on to 40 pct of the market."





ANNUAL FORECAST

Metal Coatings

Shipments of metal coating materials, especially OEM product coatings, continued their downward slide through 1982. By year's end, the slippage amounted to close to 10 pct from 1981 shipments.

In gallons, the 1982 total should wind up around the 275 million gallons shipped—about 25 million to 30 million gallons under 1981 figures.

For 1983, the feelings are that there will be little, if any, improvement—and if so, at least not until the third or fourth quarter. As one coater put it: "It appears that we'll be bouncing along a rough bottom for most of 1983."

The business outlook in other industries determines pretty much what the outlook of the paint industry will be. And as long as the automotive, farm equipment, off-the-road vehicles, appliance and other industries of this magnitude remain in the economic doldrums, the coatings industry is not likely to prosper.

It should be pointed out, too, that paint application methods and equipment are becoming more efficient so that the paint shipped to OEM product plants is covering much greater surface areas.

The pattern is very much the same with precoated aluminum and steel. Shipments of coil coaters earlier in 1982 had slipped by slightly more than 13 pct—with the slippage being slightly more for aluminum than for steel.

The industry attributes much of its current loss in shipments to slowdowns in the large consuming industries such as transportation and building products. Some slippage has also occurred in coated steel usage for preengineered building, rural building products and appliances. The one bright spot has been the increasing acceptance of weldable zinc-rich primer coatings by the auto industry.

Plastics

Considering the country's economy being in a severe decline, plastics have fared relatively well compared to other major industries. The 1982 figures of resin sales and captive uses, at last count, were running only slightly behind those of 1981 over the same span of months.

Plastics producers are already enjoying a better economic outlook than many of the industries they serve. Yet, they look to good growth just as soon as any of their major markets make a turnaround—as for example, housing, automotive, transportation and packaging. Packaging, in fact, has become a major segment for plastics, accounting now for about one-fourth of total consumption.

Despite the general economic doldrums, plastics producers have high hopes for 1983. They look toward to new and expanded usage of plastics by the automotive industry. Also, they anticipate added growth in some of their large-volume commodities.

Many plastics producers view the current recession as simply a slowdown in their growth rate—something temporary.

Reinforced plastics, too, were off in 1982 by about 9.5 pct under the 1981 figures. The year-end figures for 1982 should round off to about 1.75 billion pounds at the final count.

Almost all types of reinforced plastics were affected by the slippage. Yet, despite this, there are some hopeful signs that may help the industry to have a 1983 that will be no worse than 1982. Aircraft, for example, although still a relatively small market, is moving ahead. Construction has slipped but there's been enough of a spark to lend some encouragement into 1983. And the hope in the automotive industry is in new parts that reinforced plastics have picked up from competing materials. In construction, concrete forms of RP are gaining.

Fluid Power

Fluid power, despite its slip in 1982 sales, could push ahead again in 1983 to a $5.4 billion year—about an 8 pct gain in an industry that dropped nearly 15 pct this past year.

Nevertheless, most industry members are cautious about their 1983 forecasts. They range from no gain to 10 pct in added sales.

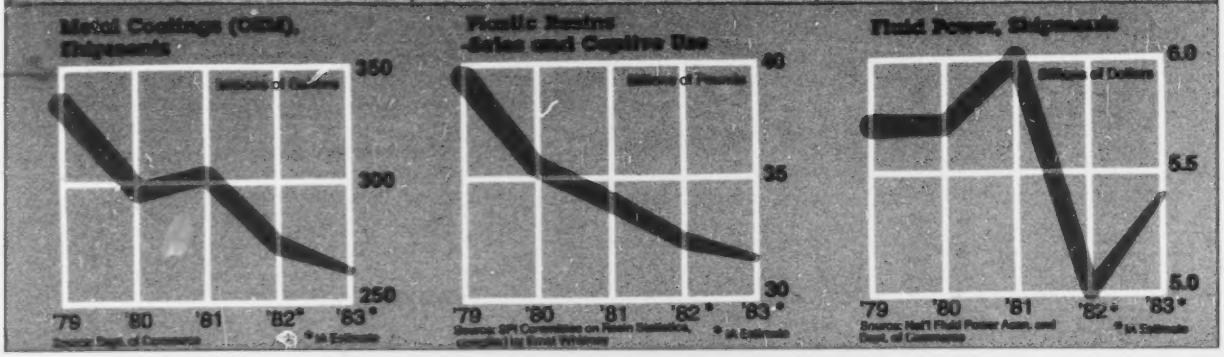
In the current climate, optimists are a minority group. Most forecasters say that part of the gain they expect during 1983 is due to new product lines that will help them penetrate some new market areas, while some of their regular lines will continue to hold even or show a small gain.

Fluid power, whether pneumatic or hydraulic, spans a number of markets, from OEM to the replacement markets. It also (because so much of the output of the industry is used as components) is something of a leading indicator.

There are some signs that are a little more positive. Autos, especially the front wheel drive units and light trucks, have been showing some gains already in 1982. This trend is expected to continue into 1983.

Another, more heartening sign is that at least a few suppliers of fluid power components to the capital goods builders who serve the auto industry now say they expect their business, even the machine tool segment, to pick up during 1983.

The big mobile markets, farm and construction machinery, aren't going to be much help in 1983. A gain in this sector in sales dollars for fluid power components will hit late, say the market observers, and not show much more than 2 pct to 3 pct gains. Materials handling equipment and mining equipment are also getting poor reviews at this early stage, even though some fluid power suppliers say they've done fairly well in coal mining machinery markets this year.



ANNUAL FORECAST

Construction

Hope springs eternal. Despite a 30 pct decline in construction machinery sales in 1982, the industry is beginning to talk about a possible 8-10 pct recovery in sales in 1983.

Although this is only a prospect, it still signals a very grim first half. Sales of construction machinery (including mining and cranes), slipped from $17 billion in 1981, to about $12 billion in 1982. It would have been deeper, but backlogs of previously ordered export machinery kept some U.S. plants working at a fair level into early 1982; and some were still holding up through second quarter, though by that time both foreign and domestic new sales were plunging.

The problems in first half 1983 will still be unsold field inventory. Some unpublished surveys already show a moderate strengthening of opinion about the 1983 building outlook at both the distributor and manufacturer levels.

A strike at the nation's biggest construction machinery builder, Caterpillar Tractor Co., had already cut off output at its dozen plants in the U.S. for a two-month period. While the company and the UAW are back at the bargaining table again, it is possible that a total three months of production from this industry giant have been written off.

All builders of construction machinery have been cutting back production since late 1981. But, sales have been falling as fast, and sometimes faster, than production cuts.

There's also been a wave of dealer closings that has thrown the equipment they were carrying back into either the manufacturers' hands, or out into the cut-rate pricing market.

Construction equipment builders won't do much to raise manufacturing rates during the first half of 1983, concentrating instead on further inventory cuts.

Farm

The projected recovery in farm equipment sales, as measured in retail tractor sales, may look better than it really is.

The key indicator, wheeled farm tractors, should advance about 8 pct in 1983, over a very bad 1982 showing.

The number looks better after the disastrous slide of 1982 in tractor retail sales, which dropped to the lowest figure in decades.

But the problems that are weighing down farm purchases haven't been solved, and pinch on farm cash is still brutal.

The big, high dollar value equipment, star performers of farm equipment builders for a decade, are still stuck in low gear.

The same problem plagues harvesting combines. Where heavy tractors fell about 30 pct in 1982, combines were down more than 40 pct by fourth quarter and were still slipping.

The fire sales of third quarter have, if anything, accelerated as builders and dealers scramble to unload more equipment. A lot of equipment is still sitting in the dealer yards.

There are some exceptions to the dire forecasts. Forage equipment has been running better for some months. This is expected to continue into 1983 with some types of forage-related machines getting a sales boost of 20 pct.

The real upturn in manufacturing isn't expected until plants begin to build for the 1984 market season. That could trigger some new production as early as September.

The inventory problem continues to be mainly at the dealership level. Manufacturers have cut their components inventory, have closed or furloughed plants and laid off workers. Some continue to report they'll manufacture at a lower rate in 1983 first half than they did in 1982, which is normally the peak factory period of the year.

Mining Equipment

"Right now, we don't even feel like we're in business," says one mining equipment company sales manager. "Sales are really rare."

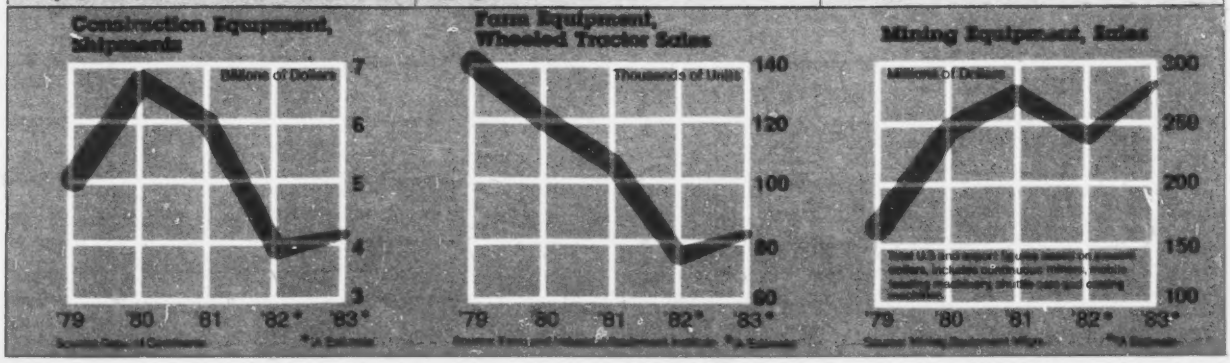
Others in the industry express similar pessimism. "We can't see this thing turning around for at least six months, maybe more," says one.

Mining equipment is not only very expensive in itself. It also is used in extremely expensive ways. A new mine or a mine to be restarted is a matter of millions. "So when you talk about costs in this business, you're talking interest rate points," says one company's financial man. "We don't expect some segments of the equipment market to recover at all in 1982. Copper, for example, may not show much activity at all in 1982. Iron ore should see some increased activity by the second quarter."

If there's any hope for mining equipment manufacturers, however, it's where it's always been. "Coal is where they look for gold," says an industry expert. Coal mining, while hardly booming in 1982, hardly collapsed either. "The coal mining industry could be doing quite well by mid-'82," he adds.

Equipment for the coal mining segment has held up fairly well and may show some good growth in 1982. Utilities expect coal to remain the basic power-generating fuel for decades in many parts of the U.S. particularly with the country's nuclear power in dustry practically dormant. "We see that as a source of long-term optimism for our industry," says one mining equipment industry leader. "We see the first half of 1983 as a repeat of the last half of 1982, but we expect some really significant growth beginning mid-year," he predicts.

"If predictions about the prime staying down are true," he adds, "we might safely predict an increase of 8 pct above 1982 for the whole domestic market."



ANNUAL FORECAST

Material Handling

Material handling companies are more than cautiously optimistic about 1983. "Why be cautious or guarded about optimism?" says one. "We expect 1983 to be a very good year for most of what we make and that includes lift trucks."

Lift trucks have not been moving very well for months. However, some industry sources have noted that there have been signs of a turnaround in that segment of the material handling market. "We've seen an increase in inquiries in the past few weeks," says one.

Larger systems makers also expect 1983 to finish well ahead of 1982. "Worldwide, our kind of product is a growth industry. All we need is clear evidence of a lasting recovery and we'll be busy beyond belief," says an industry leader. He expects capital spending to revive across the board in the U.S. by mid-83 and is boldly and openly optimistic about the material handling industry's future.

The steady decline in interest rates has also increased the hopes of managers in the industry. "At some point it will become clear to large and small business that now is the time to buy. We believe that point will be during the second quarter of '83."

Others in the industry agree that 1983 could be a very good year, up perhaps as much as 20 pct over 1982 in constant dollars. There is some cautious pessimism however in terms of the deficit. "The $180 billion we'll owe ourselves is not good, but if the economy turns around even modestly that number could shrink dramatically," notes one large systems maker.

"Personally," adds another industry source, "I think we're going to see the long-awaited capital goods boom begin some time after the first half. That means I'll also see the beginning of the long-awaited material handling boom as well."

Appliances

The consensus is that major appliance sales during 1983 will approximate 1982 figures. Some optimists, however, are predicting unit sales improvements in the range of 8 pct.

The pessimists, noting the fall-off of factory orders and growing unemployment, believe much of 1983 will be stagnant. The optimists, eyeing recent increased housing starts and some pickup in consumer spending, and believing interest rates will continue to drop, see some positive growth in 1983. No one is predicting a banner year.

Housing permits and housing starts have risen during the past several months. Appliance sales will jump when these houses near completion. Retail sales which have been sluggish since June, began to perk up in November and indications are that this strength is carrying into early December.

"With some consumer strength appearing at the end of this year, the economy appears to be stablizing; and with a fairly level economy, less impetus from the consumer will be required to start the economy up again," said one industry official.

Although finishing strong, the number of major appliances sold in 1982 will fall some 6 pct below 1981 sales figures.

October shipments of major appliances were slightly greater (0.3 pct) than shipments for the same month last year. This is the first month to show an increase in shipments over the corresponding month of the previous year, since August 1981.

The pickup was spearheaded by microwave oven shipments which were up 8 pct over October 1981 and the largest total for any month on record. Sales gains for the month also came from refrigerators, electric ranges, food disposers and dehumidifiers.

Oil Country

The upcoming year is going to be a "washout" for the oil country tubular goods (OCTG) industry, comments a major pipe distributor. He believes the industry at best can look forward to a tepid recovery occurring sometime in the second half.

In short, 1983 is not going to be too much unlike 1982, a year in which U.S. OCTG shipments nosedived from 4.2 million tons to an estimated 1.9 million tons. If this estimate is on target, it will mark the first time since 1976 that annual OCTG shipments have fallen below the two million-ton mark.

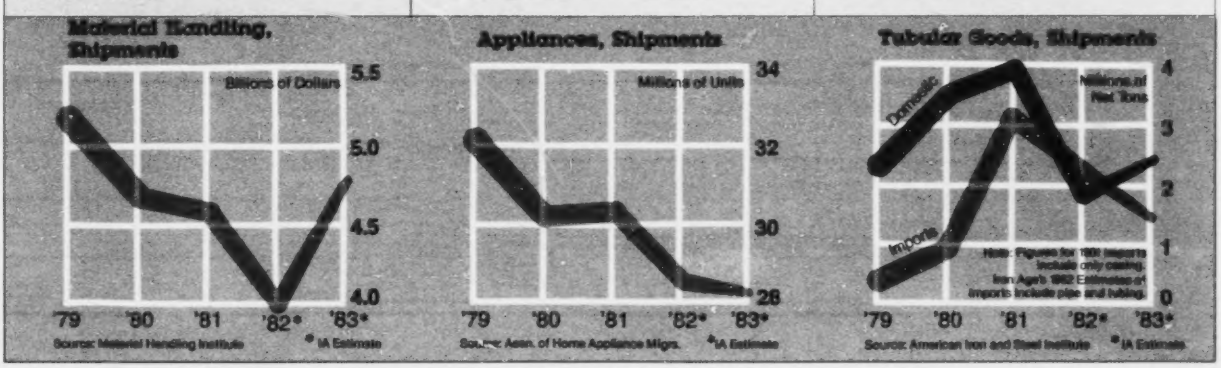
The source of much concern in the industry still remains the large inventory overhang. Current estimates have put OCTG inventory in the range of 4.5-5.0 million tons, or double the needs of the oil and gas industry. A more desired inventory level, industry members note, is 2.2 million tons.

Another source of great concern is OCTG imports. For 1982, it is estimated that imports, particularly from Japan, will have out-distanced U.S. shipments by 200,000-300,000 tons. Import penetration in the U.S. market was so great in 1982 that at one point (August) imports accounted for 516 pct of total net shipments. Imports are beginning to slow somewhat, industry sources say.

What does all this mean for the OCTG market in 1983?

The news is not good. Said one major producer, "The first quarter will be a continuation of the fourth quarter for us. Right now we're hardly even operating. We only open our doors when we get a few orders." There will be little or no buying in the first quarter, but activity will pick up in either the second or third quarters, he said.

The OCTG producer believes that U.S. mills shipments in 1983 will total 2.9 million, and that imports will drop to 1.5 million tons.



ANNUAL FORECAST

Castings

The castings industry will begin to show a recovery in 1983 after a disastrous 1982, which saw operations drop to perhaps 40 pct to 45 pct of capacity, on estimates by the Iron Castings Society.

Foundry managers say that gray and ductile iron castings will lead in the 1983 recovery, with about a 7 pct advance. That means the industry should ship about 9.1 million tons of ferrous castings, versus a very low (and revised downward) total for 1982 of only 8.5 million tons. It is estimated that the steady decline in castings output in the past three years has probably cut castings capacity by at least 2 million annual tons.

To say the least, a recovery is badly needed; but the recovery isn't expected to be a strong one.

There has been some stirring of new business in the consumer durables area. Castings aimed at appliances, refrigeration and air conditioning, and even passenger autos, show some signs of gains for January even though nobody expects much action in the first quarter of 1983.

There has also been some action in the truck and engine market. Light trucks have been performing better than expected, but now a few reports are coming in of gains in over-the-highway trucks and the castings that go into them.

Buyers of castings in large quantities are beginning to concentrate on fewer castings suppliers. This has concentrated some of the available business in the larger foundries.

The nonferrous outlook is equally troubled. A very poor first quarter of 1983 is in the cards for both aluminum and copper-based castings and the whole first half looks very slow. The best bet is that the second half will see a recovery, but it will still show very little gain in pounds of castings shipped over the 1982 year.

Forgings

Saying that the forging industry is depressed is putting it mildly. Forging facilities are at present operating well under 50 pct capacity. These low operating rates should continue through much of 1983.

Industry sources project 1982 sales of custom impression dies at $2.3 billion, down 21 pct from 1981's $2.9 billion. Bookings for the year will approach $1.4 billion, a 43 pct fall off from 1981.

For 1983 shipments are projected at $2.2 billion and bookings at $2.0 billion. Thus, projections for 1983 show shipments of closed die forgings running slightly below 1982 figures, but orders should increase, especially toward the end of 1983 as excess inventories finally dissolve.

Despite possible increases in orders, few forging producers are optimistic about 1983. A number see 1983 as a year that will be at least as bad as 1982. "We are just going to try to hang on," said one industry executive, "for we see little to be optimistic about in the coming year."

According to one spokesman: "Continued softness in key markets—aerospace, automotive, off-highway and agriculture equipment—is anticipated for at least another year. Newly added to the list of weak markets is oil field exploration and drilling which slowed down drastically in early 1982."

Military spending is on the increase, but has yet to be felt to any significant degree by most forging operations.

Open die producers are faring little better than impression die manufacturers. Shipments for 1982 are projected at $925 million, down from 1981 totals of $1.1 billion. Bookings are pegged at $700 million, a drop from $1.2 billion in 1981. Shipments for 1983 are estimated at $835 million and bookings at $665 million.

Heat Treating

Industrial heating equipment manufacturers and the commercial heat treaters are showing the effects of the strong economic tide working against them.

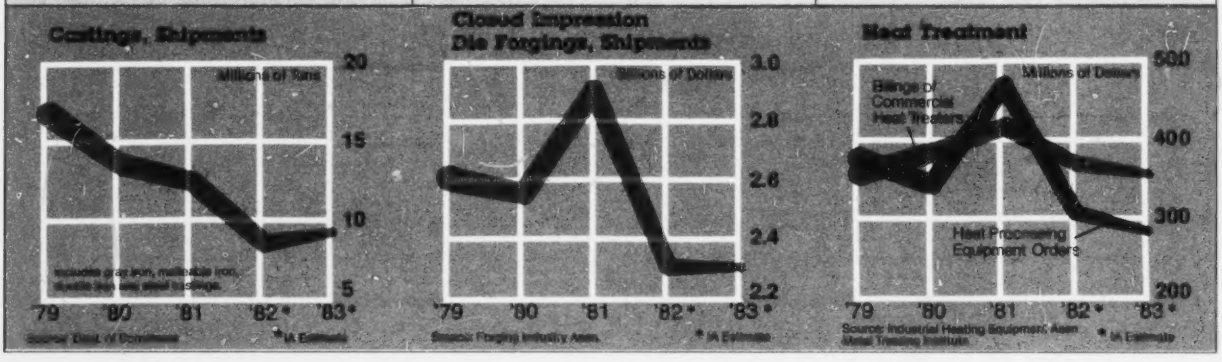
Domestic orders for heat processing equipment are expected to show a drop in 1982 of about 35 pct from the 1981 figures. However, the 1981 figures had rebounded very strongly from the previous year which gave the heat processing equipment builders an exceptionally good year.

The slippage in domestic orders for heat processing equipment is expected to continue through 1983, but not nearly at the rate in 1982. Many manufacturers, in fact, anticipate an increase in domestic orders. At the same time, a smaller number expect a further slide in domestic orders—and believe the slide will be a significant one. Overall slippage in orders for 1983 is being estimated at about 5 to 6 pct, but still a great improvement over 1982 if it materializes.

There are still major concerns over high interest rates and high fuel costs. Modernization of plant equipment has not and is not taking place as in past recent years. In fact, trimming of expenses is taking place in every quarter.

The commercial heat treaters have not fared much better. For the first nine months of 1982, figures showed them to be more than 11 pct below their 1981 level for the same period. Moreover, there's little optimism for their business outlook in 1983. Cautiously, they add, at least not until the third or fourth quarter.

The major area of hope for the commercial heat treaters is a turnaround in the industries they serve—automotive, earthmoving equipment, farm implements and energy. As for each individual heat treater, the outlook will depend on the particular industry he serves. Perhaps the least affected areas have been aerospace, high technology and defense.



ANNUAL FORECAST

Aircraft

Industry analysts look for the aircraft industry to improve slightly in 1983, but that's little solace for an industry that has nowhere to go but up after a dismal 1982 performance. New aircraft orders plunged by nearly 60 pct in 1982, with Seattle-based Boeing, the industry leader, watching new orders fall from 219 in 1981 to 60 for the first 11 months of 1982.

Only the military side of the equation improved. McDonnell Douglas, for example, was unable to sell even one DC-10 jumbo jet this year, but the production line kept rolling, thanks to the U.S. Air Force's largesse in ordering 10 KC-10s, an advanced tanker/cargo aircraft derivative.

At Boeing, U.S. government sales totaled $2.4 billion during the first nine months of 1982, up $891 million from the 1981 comparable period. Similar business growth is projected for the foreseeable future.

Officials like T. A. Wilson, the Boeing board chairman, blame the soft economy, high interest rates, tough competition resulting in high discounting and unfavorable tax provisions for the industry-wide slide. The airline companies are competing more aggressively for fewer passengers, with poorer profits resulting and little money available to purchase new equipment.

That hard cycle should continue in 1983. The International Air Transport Association predicts record financial losses for the industry worldwide in 1983, with airline deficits expected to approach $2.1 billion.

But a flurry of new equipment orders in the fourth quarter holds out some hope for a slight recovery in 1983. "We see the beginning of an upward trend for the airlines," said one analyst for McDonnell Douglas. "October traffic was very encouraging. Perhaps we're coming to the end of the line here in this recession."

Engines & Turbines

The broad-ranging engine and turbine industries are being very conservative in their forecasts for 1983, as 1982 ended far below projections.

Manufacturers of engines for construction equipment, however, are hoping for some improvement this year. Increased housing starts and possible road repair programs could mean more orders. Says one producer: "The front-end loaders, air compressors, pavers and other maintenance-type equipment don't look too bad. But I expect the big stuff won't come back through '83."

Oil field and farm equipment demand probably will be low, but politics could change either situation overnight. Producers are working under the assumption that won't happen, though. Large turbine generator sets for long-term projects continue to point downward as the power industry contracts and nuclear plant business nearly halts.

A number of manufacturers point out that orders began to pick up in the normally slow fourth quarter. They're hoping it's a sign that an upward trend is beginning, even if it's a painfully slow one.

Order books generally were slim going into the new year. Some companies took extended shutdowns hoping to accumulate some business for first quarter production.

Most producers questioned by *Iron Age* say the drop in interest rates has helped to boost orders but that buyers are still cautious. While some customers may be holding out for still lower rates, manufacturers are concerned the rates may only go up again in the months ahead.

The dollar's weakening late in 1982 may mean some pickup in export business in 1983. The currency's strength throughout most of 1982 just about killed all interest from foreign customers.

Welding

Many executives in the welding industry are breathing a sigh of relief that 1982 is history. Compared to the previous record-breaking year, 1982 was a near disaster. Shipments, including gases, plummeted from a high in 1981 of $3.6 billion to $2.5 billion, or more than 30 pct.

Several industry spokesmen say that the worst is over, and that business is showing signs of picking up again.

The recovery is anything but dramatic; at best it's very, very slight. Others are predicting a continuation of the disastrous fourth quarter and no noticeable pickup until the third quarter of this year.

All in all, *Iron Age* sees 1983 as a slight improvement over 1982.

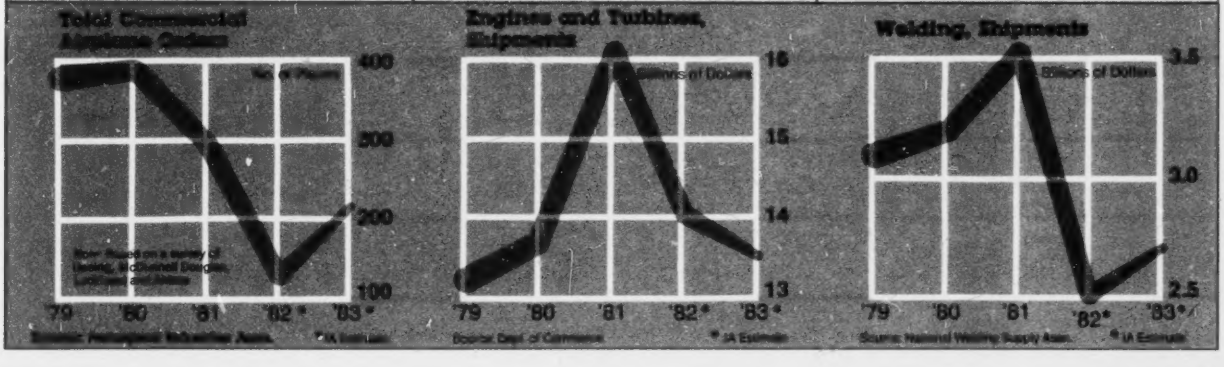
Actually, welding could have a very decent year if certain events were to take place. One is the weld repair work on highway bridges. Another is the startup of defense construction. In addition, this could be the year when things start going in the energy industry.

Despite the fact that the bread and butter items—the welding machines and electrodes—have not been doing well at all, the high technology products have been going great guns. An exception here is the arc welding robot, though even here it may be just a matter of time before robotized arc welding makes a big splash in this country.

According to the statistics compiled by the National Welding Supply Association, Philadelphia, welding shipments hit a high during the third quarter of 1981 and have been coming down ever since.

"Nobody is making any money," says one executive.

"We're finding out that some of our biggest customers are saddled with huge inventories, but they are also operating in the red," he adds.



ANNUAL FORECAST

Fasteners

"We don't see it." That's what one fastener maker says in answer to the predicted end of the recession. "We don't see it at all."

By and large, mechanical fastener companies in the U.S. see a continuing series of less than spectacular business days even if 1983 is a boom year. "Our problems are not just matters of domestic economics. We're getting killed by imports," says an industry source.

"There's no way we can compete with this dumped stuff," says another.

Some types of fasteners are almost entirely imported now. For the whole U.S. market, the import figures hover around half of domestic consumption. And, it's growing.

Yet, certain companies in the business are not nearly as worried about 1983. Those who have largely left the "standards" business and make "engineered" nuts, bolts and rivets expect 1983 to be significantly better than 1982.

Manufacturers of specials, or engineered fasteners expect the aerospace market to remain a major source of business in 1983.

"We also expect to see some growth in capital goods by mid-year," says one specials maker. "It looks like the domestic market for specials might total as much as 8 pct above 1982. But I don't expect the first half, certainly not the first quarter, to be anything different from 1982."

If there is a sustained industrial recovery in 1983, many of the companies in the engineered end of the fastener business will do well. Companies that are heavily dependent on the standard nut and bolt business have no such expectations, unless there is some action on imports.

Already, scores of U.S. standard fastener makers have left the business. Many more are expected to follow if the import flood continues.

Screw Machine Products

Government analysts are envisioning a 3 pct current dollar growth for the screw machine products industry in 1983. Industry sources are more optimistic and believe the figure could approach 10 pct.

Whether the 10 pct figure can be reached depends on how rapidly the economy picks up in 1983. If the economy waits until the tail end of 1983 to strengthen, the screw machine products industry's usual slow response to an upturn may push an industry recovery into 1984.

"The screw machine products industry traditionally comes out of a recession slower than other industries," says one official, "so while slight growth is predicted for many industries in 1983, the screw machine products industry may have trouble improving much over 1982 figures."

Counters another official: "Recovery for the industry should be more immediate this time around because inventories in comparison to other recessions are very low right now."

Others are also optimistic about some recovery in 1983. "There are several potential growth areas for the industry in 1983, areas such as office, electronic and medical equipment, computers, and military components," remarks one industry source.

If improvement does occur in 1983, it will probably be very gradual and will take place in the second half of the year. All indications are that the last quarter of 1982 and the first quarter of 1983 will be very poor. October orders slumped from a poor September, and early indications are that November and December will be even worse.

"In order for industry to follow the predicted scenario of poor first quarter in 1983 followed by a so-so second quarter and gradual pickup in the second half, interest rates must continue to drop," explains a source.

Stampings

Stampers are expecting a slightly better year in 1983 than 1982, but business will continue to lag far behind recent years. Some businesses reported a bit of activity in the third quarter of last year, but said it then dropped off in the fourth.

The more optimistic in the industry expect some improvement in the middle of 1983's first quarter. Most, however, look for little change until the third. Those tied to the diesel engine market are being "damaged severely" by the Caterpillar strike, according to one Midwestern stamper. But there's some hope, he adds, with a recent employee callback at Cummins Engine.

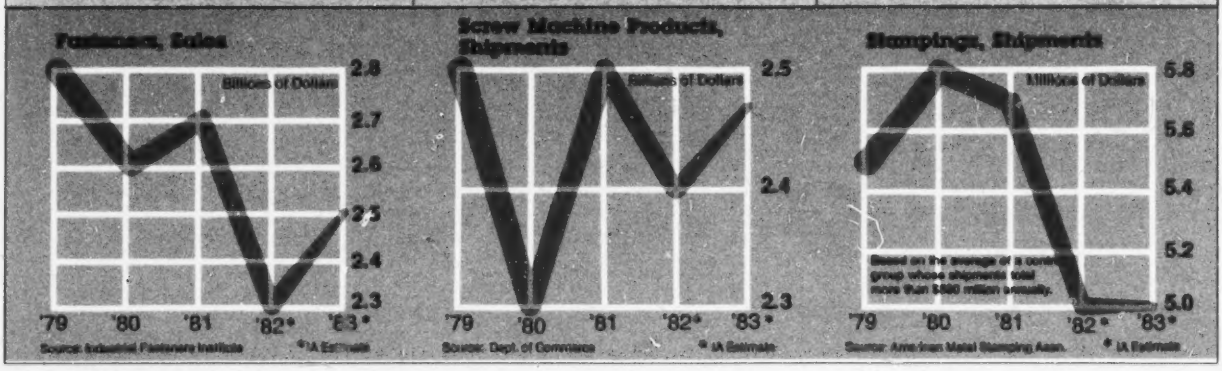
Stampers, for the most part, are carrying very little order backlog into 1983, and that's a problem. Says one Northeastern executive, "We're taking orders today for stuff we'll ship this month."

Everyone's looking to housing as a signal for better times ahead. A stamper who depends on orders from appliance makers says he's seen only a "flicker" so far.

A fellow stamper, in the plumbing market, says housing starts are up but business won't improve until there is more buying "by the people who choose to buy houses, not just the ones who have to." His inventory is at a minimum, but he's trying to "increase it 15 to 20 pct to accommodate the random buying and hold onto my customers."

Most agree that consumers are not going to start buying until they feel more comfortable about it, "when there are fewer people unemployed or insecure." Interest rates are still an area of concern, as most stampers feel they won't drop down much further.

One executive's prognosis: "Sales should be up, but volume will be less than in the 1970s. The 1979-80 period will be the best until 1984 in terms of volume."



ANNUAL FORECAST

Bearings

A forecast from the Dept. of Commerce puts current dollar growth for the antifriction bearing industry at 10 pct (4 pct real growth) for 1983. But according to bearing manufacturers, any increase in 1983 sales will be to distributors who service the aftermarket and not to OEM manufacturers.

"We see no signs the construction equipment industry will grow in 1983," said one bearing producer.

"Farm equipment and the machine tool industries are not going anywhere," reported another. "Aerospace will also remain depressed. We are getting some increased orders from the military but they are not nearly enough to offset the continuing lack of commercial orders."

According to officials, military orders are not going to have a major impact on the industry but should increase steadily through 1983.

Sales to the automotive industry will probably be up slightly next year.

"Besides seeing fewer sales next year we are feeling increased pressure from overseas bearing producers who are concontrating on the still large U.S. market now that local markets are depressed," said one manufacturer. "At present some 16 pct of the bearings consumed in the U.S. come from overseas."

With the probability of a stagnant 1983 OEM bearing market, manufacturers see some hope for sales increases in the aftermarket. "I think there will be steady small growth in that area next year," remarked a spokesman. Bearing distributors were hit badly in 1982 but have inventories in order at present and should do better in 1983.

"One problem is that many of the major OEM users have shut down many of their plants," reported a bearing manufacturer. "A number have been closed since mid-November and won't reopen till mid-January."

Valves

Valve makers have little to smile about, and the only ones with anything to grin about at this time last year—those in the oil patch—are crying the loudest now.

The outlook for the industry in 1983 is for continued slump. Interestingly, the order of which markets are best and worst seems to be switching. The AWWA municipal market suffered badly for the last year and half, but things are looking up. One marketing man says quotation activity is strong, and he figures customers wouldn't expend the effort and dollars to ask for bids if they didn't intend to execute some projects.

"Also, some companies getting bids are asking us to extend validity for 90-120 days hoping interest rates will drop a little more," he adds.

Those in the traditional multi-turn market are hardest hit, but even quarter-turn, butterfly and other producers of specialized, highly-efficient valves are feeling the pressure of the general economy. Maintenance work comprises most of the business these days, as projects are few.

One Eastern executive in the automatic control valves and regulators business says, "If anything happens in the second half of '83, we'll be happy, but we're not banking on it." He says industrial business is way off, and his company's numbers are boosted only by defense orders.

There have been massive layoffs in the oil patch. The bottom fell out and those valve makers specializing in the field took a beating. Says one valve maker *not* in the oil patch, "If the oil glut sticks around, there should be some good acquisition candidates around in that business."

Valve makers enter 1983 with slim order books, requests coming in only sporadically and for fast delivery. Foreign competition has established a beachhead, with a 40 pct share.

Gears

Gear manufacturers wrapped up a worse 1982 than anticipated, and so are cautious in their forecast for 1983. Most expect little improvement in light of the industry's tendency to lag the economy by six to eight months.

The only thing that saved 1982 from disaster for all was demand from the oil field sector in the early part of the year. But, as one executive put it, "Then the oil field collapsed and nothing else came up." There's apparently quite a bit of inventory still around as gear makers were caught unawares by the drilling dropoff.

A Midwestern executive whose company has a varied product line pointed to "slight movement" from construction, underground mining and paper/pulp customers, but "nothing indicative of a trend."

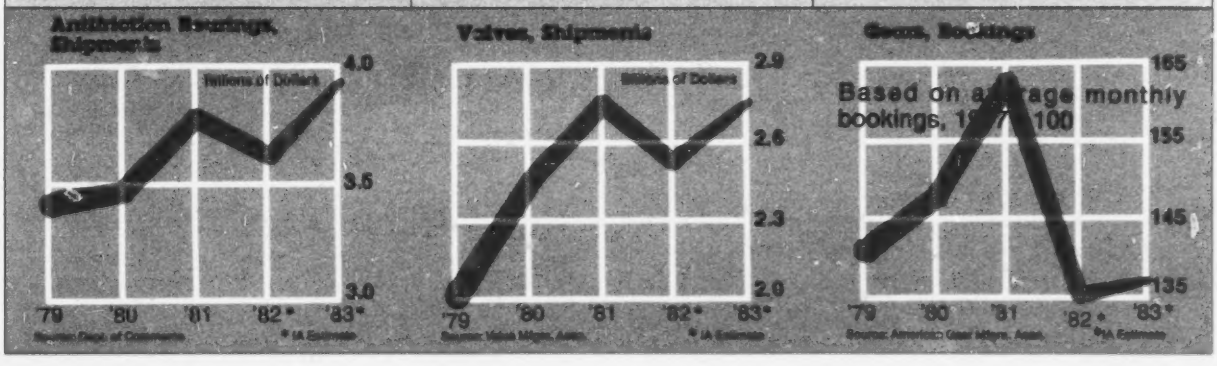
Apparently a number of gear manufacturers are considering a pursuit of military contracts. The red tape and fear of the "bandwagon" effect may scare off all but those already firmly entrenched.

Nearly every manufacturer surveyed has experienced cancellations because of capital spending cuts. Few expect that any business generated by the 5¢ gas tax-public works program to have an effect on 1983 figures. There is some hope that construction may recover a bit.

The industry is increasingly feeling the heat from foreign competitors in West Germany, Finland, Japan and Taiwan. It's affecting the industry across the board, from enclosed gear drives to fairly large gearing.

There is concern that order backlogs, which kept some firms alive in '82, are quite low. Some smaller firms are actually hoping customers will delay or stretch out orders.

One spokesman summarized the outlook as "sputtery, an odd order here and there, but no trend."



ANNUAL FORECAST

Shipbuilding

"The Navy is our only hope," says a shipbuilding expert. Truer words were never spoken.

The program to upgrade and enlarge the U.S. Navy is underway and picking up steam. But governmental budget battles have hobbled it a bit. And any full impact of the Navy rebuilding program in terms of substantial jobs and work is two or three years away. It takes a long time from Congressional funding before a keel is actually laid.

As far as merchant (commercial) ship construction is concerned there is virtually a void. And shipyards which can't get involved in Naval construction, rebuilding or repair face the very real prospect of going out of business. What's more, there's much bitterness among shipbuilders that, despite the President's promises to stimulate commercial shipbuilding (made during the 1980 campaign), they have been left out to dry.

A spokesman for the shipbuilders declared last fall, "Notwithstanding the unequivocal statements made by Mr. Reagan, there is no visible policy momentum to assure that 'our vital mobilization base is preserved' with a throughput of 'sufficient naval (as well as) commercial shipbuilding.'

"These are the President's phrases," the spokesman added. "In what can only be viewed as a deliberate contradiction of his declared intentions, the Dept. of Transportation, with an unrepentant assist from the Maritime Administration, and some members of Congress, is openly encouraging the construction and repair of merchant vessels in foreign shipyards to take advantage of the non-free trade, below-cost pricing, state-supported practices of other shipbuilding countries."

Only three new orders for commercial vessels of large size were placed in the first ten months of 1982. And as commercial shipyards exhaust their anemic backlogs the number of ships on order or under construction continues to plunge to the bottom (see chart). The auxiliary work that U.S. shipyards, not engaged in Navy work, had been using to keep afloat—has also dried up. That includes oil drilling rigs, conventional repair work, and the building of tugs and barges.

The shipyard blues are not confined to the U.S. They are a worldwide occurrence. The Japanese, long the kings of the industry, are getting out of the business—under-priced by other Asian nations.

And last fall a group of West European shipbuilders was predicting that world shipbuilding recovery would not begin until 1987. Their report read, "It's predicted that yearly deliveries will remain close to the level of 1981/1982 until 1987 when a recovery is forecast to begin. Assuming that a ship has to be ordered one to two years before completion, the volume of new orders should begin to recover in 1985-1986."

Rail Cars

It would take more than a mild recovery in 1983 to help freight rail car builders. It would take a roaring boom of the proportions of those in the 1960s.

The reasons are these: The railroads have more cars now than they need. Many relatively new cars are in storage. Because of the recession, the railroads are doing less hauling and using fewer cars.

The products they haul the most—steel, autos, coal, construction materials—are all extremely depressed. And until they come back strong, the carriers won't even begin thinking about needing new cars.

Says a manufacturer of castings for rail cars, "Basically we would have to have one whale of an economic boost—larger than ever seen—to lift this industry out of the doldrums."

The rail car industry is also suffering a hangover from the over building that took place in the late 1970s. In 1979, for example, there were 119,000 new cars ordered and 90,000 delivered, according to the American Railway Car Institute. That's why there are currently so many rail cars now in storage.

Contrast those figures with the level of orders in 1981—25,000—and those estimated for 1982 and 1983 (see chart). The 7,500 unit total for 1982 may have been a little optimistic. Through the first ten months of last year only 7,191 cars had been ordered. In October, 1982 only 884 cars were ordered.

Similarly, the estimate of new orders in 1983 used here—18,000—may be a bit optimistic and assumes a firm economic recovery. Estimates by those in the industry and by outside economic forecasters range from 13,000 up to about 20,000.

Deliveries are also in an anemic condition. Through the first ten months they amounted to 17,070. And a supplier of equipment for the car bodies says about 60,000 deliveries used to be considered just a normal year!

He goes on to say that deliveries in 1982 were probably at their lowest level since 1937 and 1938 when the total was in the 16,000 unit range. With fingers crossed, he estimates that deliveries this year could reach about 28,000.

This is a noble goal because some rail car makers have closed down their entire operation until this coming spring. And the foundries which supply the axles, wheels and other rail car components are also cutting back or shutting down entirely.

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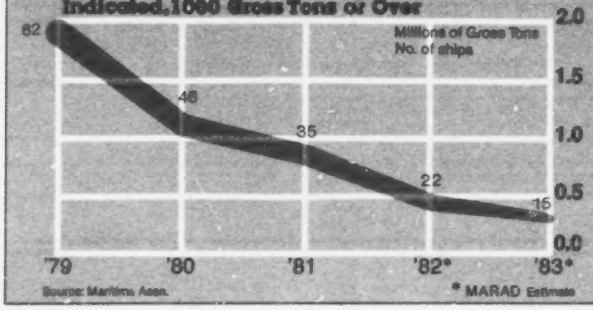
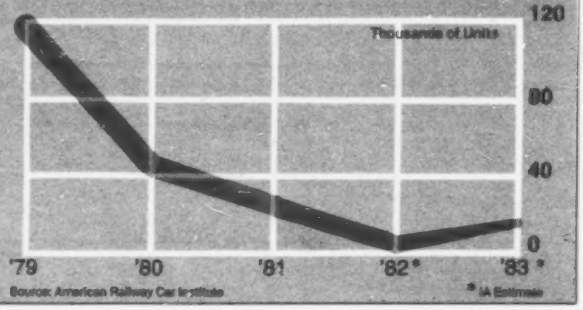
Shipbuilding, Commercial Ships on Order or Under Construction, on Dec. 31st of Each Year Indicated, 1000 Gross Tons or Over



Source: Maritime Assn. * MARAD Estimate

Rail Car Orders



Source: American Railway Car Institute * IA Estimate

LOW COSTS AND HIGH QUALITY:

THE ONE-TWO PUNCH OF THE ELECTRIC FURNACE

Electric furnace mills have had a cost advantage in most recent years but it has now reached gigantic proportions.

By George J. McManus

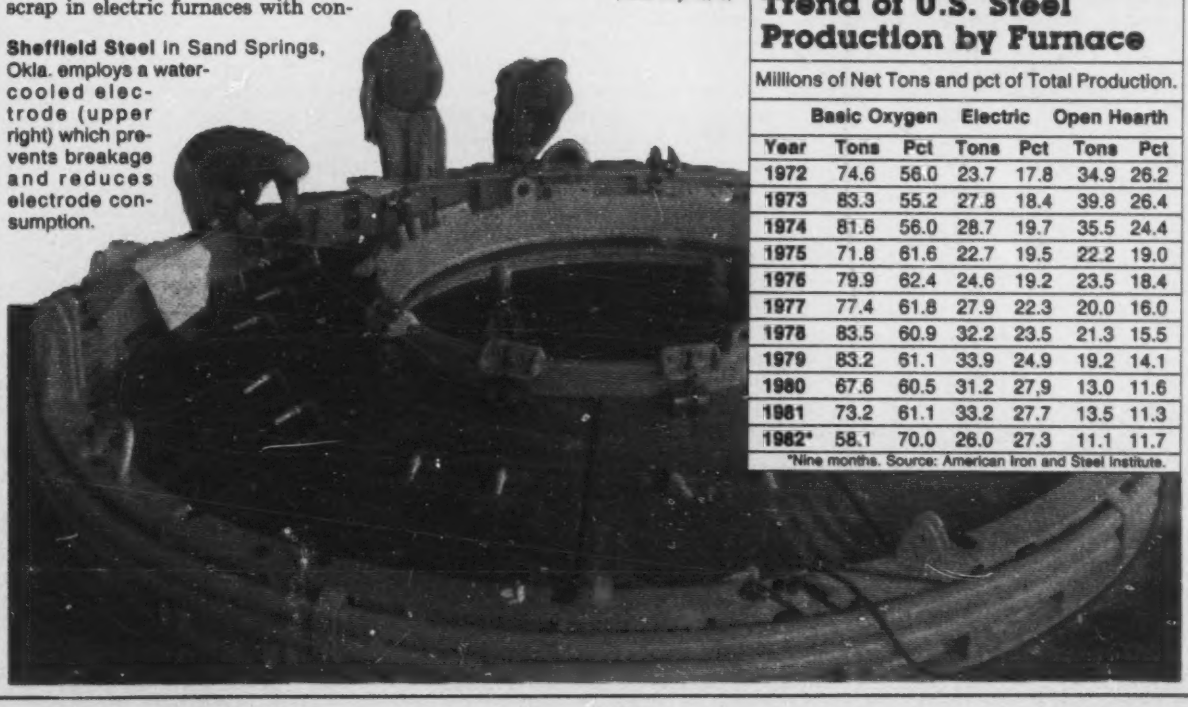
"Devastating." That was the reaction of one chief executive to word that Inland Steel Co. had reduced bar prices as much as $100 a ton.

Inland didn't exactly reduce price. The company established a product class known as Cold Melt Steel (CMS) bars. These are made from scrap in electric furnaces with continuous casting.

Inland has priced the scrap-based bars well below bars made from blast furnace hot metal in oxygen furnaces or openhearths. The price action is partly a reflection of growing competition from minimills.

The action also reflects something that could, indeed, have devastating effects. The steel industry now has a two-tier cost structure. If you start with ore and coal mines and follow through coke ovens, blast furnaces,

(Cont. on p. MP-8)



Sheffield Steel in Sand Springs, Okla. employs a water-cooled electrode (upper right) which prevents breakage and reduces electrode consumption.

Trend of U.S. Steel Production by Furnace

Millions of Net Tons and pct of Total Production.

	Basic Oxygen		Electric		Open Hearth	
Year	Tons	Pct	Tons	Pct	Tons	Pct
1972	74.6	56.0	23.7	17.8	34.9	26.2
1973	83.3	55.2	27.8	18.4	39.8	26.4
1974	81.6	56.0	28.7	19.7	35.5	24.4
1975	71.8	61.6	22.7	19.5	22.2	19.0
1976	79.9	62.4	24.6	19.2	23.5	18.4
1977	77.4	61.8	27.9	22.3	20.0	16.0
1978	83.5	60.9	32.2	23.5	21.3	15.5
1979	83.2	61.1	33.9	24.9	19.2	14.1
1980	67.6	60.5	31.2	27.9	13.0	11.6
1981	73.2	61.1	33.2	27.7	13.5	11.3
1982*	58.1	70.0	26.0	27.3	11.1	11.7

*Nine months. Source: American Iron and Steel Institute.

(Cont. from p. MP-7)

steel furnaces and ingots, your costs are high and inflexible.

Much lower and more flexible are the costs of mills that melt scrap in electric furnaces and form the liquid metal in continuous casters. The electric furnace people have had a cost edge in most recent years, but it has now reached gigantic proportions. Steel scrap is selling for $50 to $60 a ton today. It's estimated that blast furnace hot metal has a cost of $170 a ton.

Until fairly recently, the two cost tiers were segregated. The minimills moved into the merchant bar market. The integrated mills backed away from merchant products and concentrated on industrial products and markets.

Now, the picture is changing. The electric furnace mills are turning to the high quality, industrial products. This is happening at a time when competition is bringing prices down to the levels of cost and below.

Just how far the minimills have progressed in the industrial bar market depends on whom you talk to. Participation by the smaller mills is confined to the lower fringe of the market, says one tonnage producer. Individual minimills offer a different view.

Chaparral Steel Co., for one, makes special bar quality. "We have for the last four or five years," says J. A. Werner, vice president, marketing and planning. "It's very important to us."

The Monroe, Mich., plant of North Star Steel Corp. puts about 30 pct of its bars into industrial applications. Kentucky Electric Steel Co. gets 70 pct of its business from quality bar products.

"We're gaining market share during this down market," says T. G. Newman, sales vice president for Kentucky Electric.

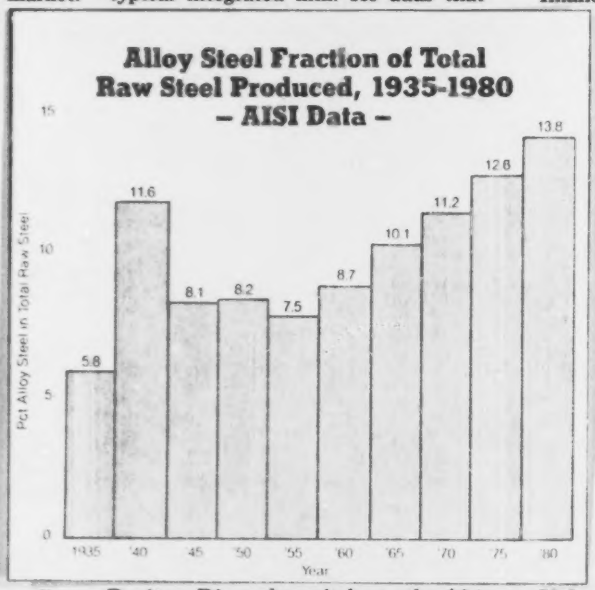
There are other areas where the two-tier cost structure could come into play. A significant portion of the country's steel plate is now made from electric furnace steel. For the most part, these furnaces are operated by the traditional plate producers.

In the Youngstown area, Hunt Steel is building the first minimill to make oil country seamless products. A new seamless mill is planned for the Southwest by York-Hanover Seamless Tube, Inc.

In the wire rod field, new companies are crowding the integrated producers. "There's no way these plants can compete with us," says W. J. Shields, president of Raritan River Steel Corp.

Mr. Shields notes that Jones & Laughlin Steel Corp. closed its rod mill at Aliquippa, Pa., in 1981. Apart from scrap costs, he says, a company like Raritan River has an advantage in operating efficiency. Raritan River has a high powered electric furnace, a five-strand billet caster, and a high speed Morgan rod mill.

With this lineup, says Mr. Shields, labor is only 15 pct of the company's cost. He compares that with 35 pct for a typical integrated mill. He adds that Raritan River doesn't have the $24 hourly employment cost of mills organized by United Steelworkers.



There are three distinct elements in the cost equation. One is the cost of scrap versus the cost of blast furnace hot metal. Scrap has been consistently less expensive in recent years and is a lot less expensive right now.

A second factor is the conversion cost in an electric furnace versus the cost in a basic oxygen furnace. Here, the picture is fluid. With water cooling, oxy-fuel burners and high power, the electric furnace keeps making efficiency gains. The performance of the oxygen furnace is also improving, and ways are being found to melt more scrap in the furnace.

The third element is continuous casting versus ingot practice. All the major minimills are 100 pct continuous casting. A number of the major mills have electric furnaces and a number have billet casters. In only a few cases are the electric furnaces tied in with the billet casters and with bar mills. Because of iron ore commitments, some of the integrated mills have shut down their electric furnaces.

CF&I Steel Corp. has gone the other way, shutting down blast furnaces and concentrating production in electric furnaces. The electrics are tied in with continuous casting.

Inland Steel has a minimill set-up: electric furnaces, billet casting, and bar mills. Inland also has a blast furnace-BOP complex and is continuing to operate this.

"We are fortunate in that we've got both facilities," says J. W. Cox, manager of sales for Inland's bar division.

Inland considers this fortunate because it still sees a place for what it calls Hot Melt Steel (HMS) bars. "HMS bars will meet the quality needs that only an integrated steel producer can provide," the company's announcement stated.

At the same time, Inland is quick to say there's nothing wrong with its Cold Melt Steel (CMS) bars. "This is not a second class product," says Mr. Cox. "The reason for the high price (on HMS) is more for the method of manufacture than from any quality distinction."

Why, then, would anyone pay more for the hot melt bars? Mr. Cox acknowledges this is a good question. "I guess that's why we made the move," he says. "We were losing business."

If these statements seem a little contradictory, they really aren't. The electric furnace-continuous casting route is fine where it can be used. "One charateristic of continuous cast steel is the better surface," says Mr. Fox of North Star.

However, the casting process still has some limitations. Lead-free machining steel is a problem product; the lead vaporizes off. There are some auto specifications that call for ingot practice. The area reduction specifications in some cases make it necessary to start with large ingots.

With regard to size, Inland's Cold Melt price doesn't apply to rounds over 3⅜ inch diameter. Chaparral's maximum round size is 4 inches. Kentucky Electric has a maximum billet size of 5 by 7 inches. That translates into a maximum round of 2½ inches.

Apart from size and chemistry, the habits and perceptions of a few customers still favor the old, tried and true ways. "This becomes a very subjective thing," says Mr. Werner of Chaparral.

There were some real problems when continuous casting was first applied to

quality bars. Contributing to the problems were overly ambitious actions of mills that had grown up rebars and other construction products.

"Some small mills tried to jump in and take business they weren't equipped to handle," says Mr. Newman of Kentucky Electric.

This did give continuous casting a bad name with bar users, he says, but the problems are now ancient history. Kentucky Electric makes carbon, special quality, low alloy and alloy bars. The company has six metallurgists and considers its lab one of the best in the industry.

"No one is looking down their nose at Japanese quality," says Mr. Fox of North Star. The Japanese are continuously casting a high percentage of their steel, he notes.

In the rod field, says Mr. Shields, Raritan River has been given a No. 1 rating by a number of wire drawing plants with critical quality requirements.

In terms of market acceptance and technology, Inland feels continuous casting of bar steel has reached full maturity. This conclusion influenced the timing of Inland's price move.

"We wanted to see the technical improvements in strand cast steel." says Mr. Cox.

The other factor in Inland's decision was competitive pressure. "We are a market driven company," says Mr. Cox. "The market determined where the price should be."

He estimates the minimills have taken over 30 pct of the total bar market. With demand down, this slice forced general recognition of minimill prices.

"Inland is just doing what all of us have been doing right along," said the head of one large bar mill.

The thrust of the minimills brings a different style of management to bear on the steel industry. Nucor Corp., for example, has a philosophy of cutting prices and trying to maintain production. The traditional steel view was that you cut production and tried to maintain prices.

As a practical matter, the old tradition was abandoned long ago. There has been widespread discounting by tonnage mills in recent years. However, minimill prices are probably more volatile than tonnage mill prices, moving up as well as down.

As this suggests, the minimills believe there is price-volume elasticity in their markets. This is partly a matter of taking business from other companies, but it also involves the markets, themselves.

After Inland's price announcement, Chaparral Steel put through its own price cuts. The timing of Chaparral's action was affected by Inland, but the price changes were planned earlier for the first of the year.

"We're seeing more downstream penetration by imports of fasteners, forgings and other products," says Mr. Werner of Chaparral. His thought is that the well-being of customers depends partly on getting bars at prices that are competitive with those of foreign steel mills.

Much the same point is made by Mr. Newman of Kentucky Electric. "We're beginning to see more and more imports of finished parts," he says. He mentions auto leaf springs as one imported item.

This electric arc furnace at Raritan River Steel has a 93 MVA transformer rating and is computerized to ensure consistency of the steel product produced.

"Our basic philosophy," says Mr. Newman, "is that within the next five years, you've got to be able to compete in the world market. We have to be able to compete so our customers can compete."

Wire rod producers are less enthusiastic about the one-world concept. Dumping complaints against rod from Brazil, Trinidad, and Tobago were filed Sept. 30 by Atlantic Steel Co., Raritan River and others. Complaints against European rod producers were only withdrawn after the recent voluntary quota agreement.

Nevertheless, Kentucky Electric is addressing itself more to foreign competition than to the domestic tonnage mills. "We basically don't see the major mills as long-term competitors," says Mr. Newman.

These comments are typical of the expansive, confident attitudes found among the minimill people. With the tonnage industry going through another painful contraction, the minimills are pushing for a larger place in the sun.

"We market in 36 states," says Mr. Shields of Raritan River. "We can produce 650,000 tons." These are hardly minimill dimensions, he notes.

"We just completed a $30 million expansion," says Mr. Newman. This has doubled Kentucky Electric's capacity.

Chaparral has spent $200 million to build a complete new mill. This has raised the company's melting capacity to 1 million tons and its rolling capacity to 1.6 million tons.

Quanex Corp. is building a 280,000-ton plant at Fort Smith, Ark. Ohio River Steel Corp. is bringing a new rolling mill on stream. Nucor, Bayou Steel Corp., and Florida Steel Corp. recently built new plants.

None of which means the minimills

are getting rich right now. Costs are down but so are prices and orders. Florida Steel Corp. lost $2.2 million in the third quarter. A third quarter loss of $3.2 million was reported by Roblin Industries, Inc., which owns Roblin Steel Co.

Chaparral was holding its own, partly on the basis of new accounts. "We don't see any dramatic pickup for the next six or seven months," said Mr. Newman of Kentucky Electric.

With regard to the longer term, a number of factors will influence the direction of minimills. One is capital cost. The low capital costs of minimills have been based partly on making products that require a limited amount of finishing. To get in on the sheet business with conventional mills today would probably take at least $1 billion. This picture may change but right now there is no such thing as a small sheet mill.

As a general rule, capital costs tend to rise as you go up the quality scale. For conditioning bars at Canton, Ohio, Republic Steel Corp. has installed what is probably the world's largest grinding complex.

At Warren, Ohio, Copperweld Steel recently completed a $64 million program that included new grinding, cold finishing and heat treating facilities. Another $12.5 million was then spent on six machine grinders.

The minimill competition has been "less in the value added products," says R. L. Loughhead, president of Copperweld Steel. By value added, Mr. Loughhead means heat treated or cold finished.

Capital costs are also being affected by the tighter standards for quality steels. The Japanese have made steels with sulfur contents as low as .001, says Ralph Smailer, industrial group manager for arc furnaces at Davy McKee Equipment Corp.

In the old days, electric furnace practice was ideally suited to the removal of sulfur and other impurities. Used almost exclusively for specialty steels, the furnace was operated with an oxidizing slag first and then a reducing slag. With the second slag, sulfur could be brought down to .005.

When the electric furnace moved into carbon steel, it was scaled up and souped up. The emphasis on production made it undesirable to use the second slag practice. With oxygen lancing, moreover, and with pollution systems drawing air into the furnace, it became impractical to get reducing conditions.

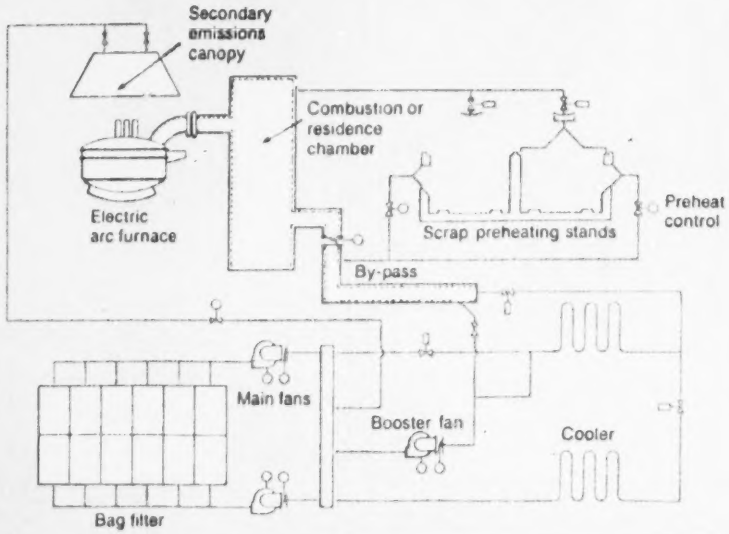
That is one of the many considerations that have led to the spread of ladle refining. Davy-McKee has signed up to provide the ladle technology of Japan's Daido Steel. One of the tricks, says Mr. Smailer, is to make a good, 'white' reducing slag in the ladle.

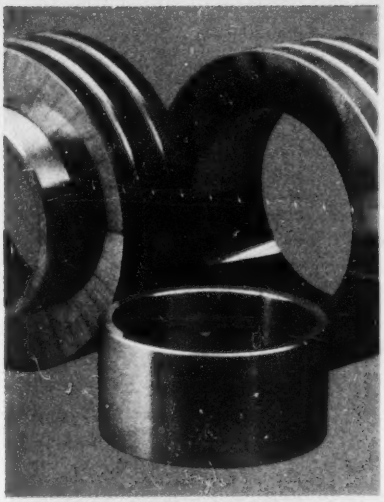
"As you lower the slag's oxidizing potential," he says, "it sucks up sulfur."

There is no question ladle treatment is closely linked to the future of electric steelmaking—all steelmaking, for that matter. "We've sold five ladle metallurgy jobs since the first of the year," said T. B. Slovik, manager of arc furance sales for Lectromelt Corp.

As of October, the Lectromelt sales included: a twin-snorkel vacuum degasser to go with the new rail mill at the South Works of United States Steel Corp.; a ladle furnace with a desulfur-

Design for Scrap Preheating System





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Electric Furnace Production/Consumption

		1961	1971	1977	1978	1979	1980	1981
Ferrous Scrap for Recycling Purchased domestically by:	Steel Mills	—	22.7	26.1	30.3	32.1	29.3	30.2
	Foundries	—	11.3	15.8	15.8	14.9	11.7	11.8
	Total	**25.3**	**34.0**	**41.9**	**46.1**	**47.0**	**41.0**	**42.0**
Home Scrap Produced in:[1]	Steel Mills	—	42.6	42.4	44.9	45.4	37.0	38.4
	Foundries	—	6.6	7.1	7.2	6.8	5.2	4.8
	Total	**38.5**	**49.2**	**49.5**	**52.1**	**52.2**	**42.2**	**43.3**
Purchased & Home Scrap consumed by:[1]	Steel Mills	51.8	64.6	69.3	76.3	77.2	66.6	68.3
	Foundries	12.6	17.9	22.9	22.9	21.7	17.1	16.8
	Total	**64.3**	**82.6**	**92.2**	**99.2**	**98.9**	**83.7**	**85.1**
Exported (Includes purchased & home)[5]	Carbon***	9.7	5.52	5.95	8.78	10.75	10.86	6.24
	Stainless	**	1.00	0.08	0.11	0.11	0.12*	0.06
	Alloy**	**	0.05	0.07	0.15	0.20	0.19	0.11
Prices (Composite, yearly average in dollars per gross ton)[2]	No. 1 Heavy Melting	36.28	34.09	63.15	76.23	97.91	91.35	91.53
	No. 2 Bundles	24.72	23.55	44.11	50.28	62.89	63.71	64.31
Iron Ore[1]	Mined domestically	79.9	90.5	62.4	91.4	96.0	78.0	83.2
	Imported	28.9	44.9	42.5	37.6	37.8	28.1	31.7
	Blast furnace iron consumed	65.8	81.2	82.0	88.4	87.5	69.1	75.0
Ferrous Production	Raw Steel Production[3]	98.0	120.4	125.3	137.0	136.3	111.8	119.9
	Steel Mill Shipments[3]	66.1	87.0	91.1	97.9	100.3	83.9	87.0
	Ferrous Foundries—Castings Shipments[4]	12.8	16.3	17.5	18.1	17.2	13.8	12.0
Finished Steel Composite Price[2] (yearly average, cents-per-pound)		6.196	8.429	15.577	17.957	20.006	21.655	24.224
Steel Production[3] by type of furnace and percent of total output	Basic Oxygen Furnace	4.0	63.9	77.4	83.5	83.2	67.6	73.2
	Percent	**4.1%**	**53.1%**	**61.8%**	**60.9%**	**61.1%**	**60.5%**	**61.1%**
	Electric	8.7	20.9	27.9	32.2	33.9	31.2	33.2
	Percent	**8.8%**	**17.3%**	**22.3%**	**23.5%**	**24.9%**	**27.9%**	**27.7%**
	Open Hearth	84.5	35.6	20.0	21.3	19.2	13.0	13.5
	Percent	**86.2%**	**29.6%**	**16.0%**	**15.5%**	**14.1%**	**11.6%**	**11.3%**
Ferrous Scrap Consumption by Furnace (purchased & home)[1]	Basic Oxygen	1.4	20.1	25.0	26.0	26.5	21.9	23.3
	Blast	3.6	3.7	3.8	4.2	4.1	3.7	4.0
	Cupola	9.5	14.8	14.3	14.1	12.8	9.4	9.1
	Electric	10.1	24.7	36.4	41.3	43.6	40.2	39.6
	Open Hearth	37.9	18.8	11.1	11.8	10.5	7.4	7.5
	Other	1.9	0.8	1.6	1.9	1.5	1.2	1.5

Sources: [1]U.S. Bureau of Mines (in millions of net tons) [2]*Iron Age* [3]American Iron & Steel Institute (in millions of net tons) [4]U.S. Bureau of Census (in millions of net tons) [5]Pre-1975 U.S. Bureau of Mines; post-1975 U.S. Bureau of Census *Preliminary **Not reported separately; included in carbon ***Pre-1978 data adjusted for comparability with post-1977 data

ization lance for CF&I Steel Corp.; a desulfurization unit for Sharon Steel Corp.; and a ladle refining system for Marathon Le Tourneau Co. The Marathon system can perform seven different functions at one station.

A recent Lectromelt order for a multiple injection sulfur removal system came from Inland Steel. This will be used in the electric furnace shop.

Lectromelt has been supplying ladle systems since 1958. The company's process lineup gives some idea of the current scope and sophistication of secondary steelmaking. Processes offered under license from Vacmetal of West Germany include: D-H single snorkel, twin snorkel and continuous flow degassers; ladle degassers with oxygen refining and arc reheating; and stream degassing into both ladles and molds.

Lectromelt offers the ladle injection technology of Kloeckner Stahltecknik. The company is licensed to supply the tap hole slag stopper of Fabrique De Fer of Belgium.

The smaller electric furnace companies are among those moving with the trend toward secondary refining. At Jackson, Mich., the MacSteel Division of Quanex Corp. is equipped with a Lectromelt vacuum degasser and a Scandinavian lance injection system. In addition, the plant uses argon stirring on all heats. The new Quanex plant in Fort Smith, Ark., is being equipped with a secondary refining furnace.

These advances add to the operating efficiency and versatility of electric steelmaking. They also add to capital cost. The Japanese are said to be building ladle furnaces with as much power as a typical arc furnace a few years ago.

The arc furnace, itself, is undergoing major changes. Water cooled roofs and side walls, water cooled electrodes, oxy-fuel burners, and computers are making the furnace more efficient and more expensive.

It's possible added capital costs will change the nature of minimill steelmaking. Much more critical, however, are questions involving the quality, availability and price of steel scrap.

In recent years, indicates Mr. Fox of North Star, the real problem has been the inability of the domestic industry to absorb the available scrap. The overflow has been going to Japan and Europe and coming back as finished steel products, he says.

The export question is controversial, but recent domestic demand for scrap has not been excessive. Scrap purchases of domestic mills and foundries ranged between 41 and 47 million tons over the last five years. (The foundry portion is about a third.) The upper level was well

(Cont. on p. MP-17)

(Cont. from p. MP-15)

below the 1974 peak of 51 million tons.

Slightly over half the purchased material is obsolete scrap. This is entirely suitable for many construction applications. "An angle is an angle is an angle," says Mr. Iverson of Nucor. As long as a merchant bar does the job, he indicates, users aren't interested in the metallurgical pedigree.

The so-called "tramp" elements, which are associated with obsolete scrap, aren't necessarily bad, says Mr. Fox of North Star. "I don't think we properly evaluate residuals," he says. "Twenty points of copper doubles the corrosion resistance of construction steel." It's possible to engineer around things like chrome, he says.

For many products and processes, however, it is necessary to use a good grade of scrap. "You get nervous when copper is around 0.18 or 0.20," says E. L. Bartolotta, manager of technical services at the Lorain Works of U. S. Steel. "Especially when the sulfur is high."

The high alloy content can cause cracking when the steel is hot worked. It produces oscillation cracks in continuous casting. For sheet grades, the chemistry of the steel is critical.

"Residuals do cause a loss of ductility," says Mr. Bartolotta. U. S. Steel feels the total alloy content for tinplate and deep drawing sheet should not exceed 0.12 pct.

Minimill people say there is no problem getting good quality material. "If you want to segregate scrap," says Mr. Iverson, "you can come up with the same residuals (as hot metal). We do segregate our scrap for cold finished bars."

Prompt industrial scrap "is becoming more and more available," says Mr. Shields of Raritan River. He notes that Raritan River recently bought scrap from a Ford Motor plant that has traditionally sold to one of the integrated mills. He adds that Raritan River is producing rods "of a quality I wouldn't have believed a few years ago."

Others are equally confident. "There is going to be a continuing good supply of good scrap," says D. R. Gill, director of purchases and traffic for Lukens. Residual content "is a problem but one we've learned to live with."

Nevertheless, there is a finite limit to the supply of prompt industrial scrap. More specifically, there is a limit to the amount of industrial scrap available at low prices.

"I do not see any shortage as long as electric furnace steel does not go over 33 pct and total steel production above 130 million tons for a sustained period," says W. W. Blauvelt, president, Luria Brothers & Co., Inc.

If you get that combination, says Mr. Blauvelt, "then you begin to come to the limits of industrial scrap." In 1979, he notes, the price of industrial scrap rose to $140 a ton when raw steel output went over 136 million tons.

Most estimates call for sluggish growth of the steel market in coming years, says Mr. Blauvelt. If the forecasts are right, he indicates, there should be enough scrap.

In the past, rising scrap prices have been accomplished by rising steel prices. During the 1974 boom, the minimills were able to add scrap surcharges to their prices. More important, when steel prices have weakened, the same thing has happened to scrap prices.

So far, the price pattern hasn't been altered by the added scrap melting potential of new electric furnaces. The electric furnace portion of steelmaking increased from 17.8 pct in 1972 to 27.9 pct in 1980. There has been no increase in the percentage since 1980 although big electric furnaces have come on stream at Jones & Laughlin Steel Corp. in Pittsburgh, Bethlehem Steel Corp. at Johnstown, Pa., and at Crucible Steel in Midland, Pa. These are in addition to the minimill expansions.

The recession has prevented the test of scrap supply that might have been provided by new furnace capacity. Crucible's Midland plant has been closed. Bethlehem isn't operating its Johnstown furnaces. Jones & Laughlin has turned off the new electric furnaces at Pittsburgh as well as older furnaces at Cleveland.

Part of the problem is the cash squeeze. Scrap is cheap but its use entails cash outlays. The mills must pay for iron ore, too, but in many cases, they are committed to a certain quality of ore. As a result, companies are forced to increase their hot metal percentage at a time when scrap is much less expensive.

Because of this experience and other developments, integrated producers are considering strategy that would give greater flexibility of raw materials. Apart from the scrap situation, there is a desire to make use of the rich ores available at low prices on the open market.

"With the development of new iron ore deposits in Brazil, additional pressures downward will be put on ore prices," says W. R. Roesch, president of United States Steel Corp.

The integrated mills are also working on ways to melt more scrap in basic oxygen furnaces. Combined blowing and carbon injections are being tried. Kaiser Steel Corp., which has announced the shutdown of blast furnaces and coke ovens, is keeping close tabs on German

(Cont. on p. MP-20)

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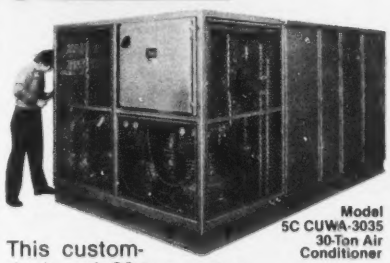

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(Cont. from p. MP-17)

developments involving an all-scrap charge.

U. S. Steel has been able to boost scrap charges by using soaking pits for pre-heating. Others have pre-heated by injecting oil through the bottom tuyeres of oxygen furnaces.

There is no question the basic oxygen furnace, with its limited scrap melting capability, has been a major factor in keeping scrap prices low and scrap supplies ample. According to one authority, the price and supply balance would be altered significantly by just a 1 or 2 pct increase in the scrap purchases of integrated mills.

Another factor could be a general build-up of residuals in scrap. The residuals include copper, nickel, chromium, molybdenum and a few other non-oxidizable elements.

"No economical refining method exists for removal of these impurities once they enter liquid solution with iron," says R. D. Burlingame, director of research for Luria Bros.

Making for a residual buildup, says Dr. Burlingame, is a steady increase in the alloy portion of steel output. He notes that various studies call for this trend to continue.

Without highly sophisticated systems, he says, it's probable that "look-alike carbon and alloy steels will unavoidably become increasingly co-mingled upon recycling both as prompt industrial scrap and as obsolete scrap."

Apart from internal alloys, says Dr. Burlingame, scrap can pick all kinds of nonferrous metal as it passes through the manufacturing and recycling sequences.

"The practical question," he concludes, "is when will the tramp alloy quality of the nation's scrap become a really serious problem."

Others are more optimistic, saying there is no hard evidence scrap quality is deteriorating. The American Iron and Steel Institute made one check. "They really could not pin down a buildup of residuals," says Mr. Gill of Lukens.

The American Foundrymen's Society received the results of another study early in 1982. "If anything was demonstrated, it was that there was insufficient evidence to make a case one way or another," says an official of the Society.

The Foundrymen group is now tracking scrap quality on a quarterly basis. "The committee has concluded more data will be needed to make a statistically reliable conclusion," says the same official.

The subject of scrap quality was touched on in a recent report on direct reduction by William T. Hogan, S. J. and F. T. Koelble of Fordham University.

"The general perception of the operators contacted is that the overall quality of their scrap has been deteriorating . . . ," said the report.

To meet quantity and quality needs, the report concluded, electric furnace shops could be charging as much as 5 million tons of direct reduced iron (DRI) by 1985.

This prospect presents no great technical challenge. "One year, 20 pct of our material was DRI from Georgetown," says Mr. Iverson of Nucor.

Electric furnace keeps advancing even though the industry is in the throes of a depression.

A move to large quantities of reduced iron would change the economics of electric steelmaking.

According to one recent estimate, cost of metallized iron ranges from $140 to $150 a ton. With scrap prices low and natural gas prices rising, Georgetown Steel has shut down its direct reduction plant.

Electric furnance technology keeps advancing. The building of complete new furnaces has been slowed by the recession but it has not been completely stopped.

New Krupp furnaces are going in at Babcock & Wilcox and Timken Co. A Krupp furnace is now operating at Bayou Steel Corp. Low power consumption and low electrode usage are advantages of this technology, says a Krupp official.

Domestic furnace builders say the big advantage of foreign competitors is that their association with foreign steel mills provides an opportunity to demonstrate new technology and also to provide a package that includes hands-on process training. Mannesmann Demag Corp., which has developed a bottom pour electric furnace, stresses its ability to provide process know-how for both continuous casters and furnaces.

The conversion of electric furnaces to water cooling has been checked by the slump. "I would probably say 30 to 40 pct are using some type of side wall coverage," says Al Kocher, manager of electric furnace product sales for Wean United, Inc.

Many of the remaining shops have indicated plans for water cooling when money is available. A recent development is the use of cast panels down to three or four inches above the slag line.

Mr. Kocher estimates 18 to 20 pct of the electric furnaces have water cooled roofs. Apart from the recession, he says, the switch to new roofs has been slowed by the longer lives of conventional roof refractories. Water cooled side walls have reduced erosion that the point where the roof sits on the sidewall.

There seems little question water cooling is the wave of the future. In addition to Wean United, suppliers include Korf & Fuchs Systems, Inc., Lectromelt, Mannesmann Demag and Danieli of America, Inc. Both Danieli and Mannesmann Demag use tubular systems.

Wean United is supplying the composite electrode developed by Stelco, Inc. In this design, a water-cooled steel jacket serves as the upper section. This gets away from the oxidizing of graphite by furnace gases. Reduced breakage and reduced electrode consumption are benefits.

Stelco composite electrodes are being used by Standard Steel in Burnham, Pa. Sheffield Steel is working with composite electrodes from Lectromelt.

The use of exhaust gases for pre-heating scrap is attracting interest. Baumco Inc. and Nippon Kokan are among the companies which have developed pre-heating systems. Both report success in preventing fumes from oily scrap.

"No pollution has been caused and environment inside the shop has scarcely been worsened," says Nippon Kokan.

Swank Metacon Systems Co. reports good results from the use of a slide gate to keep slag out of the ladle. A Swank Metacon taphole valve system has been installed at the Baytown, Tex., works of U. S. Steel.

Lectromelt says its Belgium system, which employs an articulating arm, gives less than 1 pct slag carryover.

The plasma furnace may finally be reaching commercial maturity. "We are installing a 50-ton facility in Linz," says an official of Voest-Alpine International Corp.

If historic ties mean anything, the location of the new furnace could be significant; it was at Linz, Austria, that the basic oxygen process was developed.

Advantages claimed for plasma include low noise levels and high alloy recovery. Voest has been working with the East Germans, who have been operating a 45-metric-ton furnace. Some of the technology may have emanated from Russia, where there is said to be a 200-ton plasma furnace. □

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Steel Production

World Steel Production

Raw steel, thousands of metric tons

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982*
Argentina	2,151	2,205	2,353	2,208	2,410	2,684	2,786	3,199	2,687	2,541	3,000
Australia	6,751	7,899	7,813	7,889	7,794	7,338	7,596	8,119	7,589	7,635	6,300
Austria	4,069	4,238	4,699	4,069	4,476	4,093	4,335	4,917	4,623	4,656	4,300
Belgium	14,532	15,522	16,227	11,582	12,145	11,256	12,601	13,442	12,322	12,283	9,800
Brazil	6,516	7,150	7,515	8,387	9,253	11,253	12,205	13,893	15,309	13,213	13,300
Bulgaria	2,121	2,246	2,188	2,295	2,460	2,589	2,489	2,482	2,567	2,483	2,500
Canada	11,863	13,388	13,623	13,025	13,290	13,631	14,899	16,054	15,901	14,811	12,150
China*	23,383	25,219	21,119	23,903	20,459	23,740	31,780	34,484	37,121	35,900	35,500
Czechoslovakia	12,728	13,158	13,640	14,324	14,693	15,054	15,294	14,817	14,925	15,270	15,000
France	24,054	25,270	27,021	21,531	23,227	22,094	22,844	23,360	23,176	21,261	18,500
W. Germany	43,705	49,521	53,232	40,412	42,413	38,984	41,253	46,040	43,838	41,610	35,750
E. Germany	6,065	5,855	6,185	6,480	6,740	6,850	6,978	7,024	7,308	7,467	7,500
Hungary	3,273	3,332	3,468	3,671	3,652	3,723	3,773	3,907	3,767	3,645	3,700
India	6,856	6,869	7,068	7,991	9,384	10,009	10,099	10,126	9,514	10,780	10,300
Italy	19,613	20,995	23,804	21,865	23,455	23,335	24,283	24,250	26,501	24,777	24,000
Japan	96,900	119,322	117,131	102,313	107,399	102,405	102,105	111,748	111,395	101,676	99,800
N. Korea*	2,500	2,900	3,200	2,900	3,000	4,000	5,000	5,400	5,800	5,500	5,750
S. Korea	586	1,157	1,947	1,994	3,515	4,347	4,969	7,610	8,558	10,753	11,800
Luxembourg	5,457	5,924	6,447	4,824	4,565	4,329	4,790	4,949	4,618	3,791	3,400
Mexico	4,431	4,780	5,136	5,272	5,298	5,801	6,711	7,005	7,089	7,605	7,100
Netherlands	5,585	5,823	5,837	4,817	5,178	4,923	5,583	5,806	5,264	5,484	4,450
Poland	13,424	14,057	14,556	15,007	15,640	17,841	19,251	19,218	19,485	15,719	15,700
Rumania	7,401	8,161	8,840	9,549	10,970	11,457	11,780	12,909	13,175	13,025	14,000
South Africa	5,337	5,722	5,839	6,831	7,106	7,295	7,902	8,876	9,068	9,004	8,500
Spain	9,526	10,800	11,502	11,102	10,982	11,169	11,339	12,248	12,672	12,919	13,200
Sweden	5,257	5,663	5,988	5,611	5,139	3,958	4,327	4,700	4,237	3,770	3,950
U.K.	25,431	26,687	22,384	19,773	22,396	20,467	20,367	21,523	11,342	15,573	14,000
U.S.S.R.	125,589	131,481	136,200	141,325	144,805	146,655	151,400	149,087	147,931	148,517	146,000
U.S.	120,874	136,902	132,195	105,816	116,120	114,700	124,002	123,276	101,896	108,782	67,500
Yugoslavia	2,588	2,676	2,636	2,916	2,751	3,182	3,456	3,535	3,634	3,977	3,800
Others	11,076	13,022	13,790	13,548	14,970	17,672	21,061	24,612	25,748	22,749	22,450
Total	638,735	687,534	703,763	642,880	675,511	675,635	717,150	746,448	718,818	706,856	645,800

*Estimates. Source International Iron and Steel Institute.

U.S. Yearly Raw Steel Production†

Net Tons

	Openhearth		Basic Oxygen Process		Bessemer**		Electric**		
	Production	Percent of Total Output	Production	Percent of Total Output	Product	Percent of Total Output	Production	Percent of Total Output	Total Production
1952	82,846,439	88.9	---	---	3,523,677	3.8	6,797,923	7.3	93,168,039
1953	100,473,823	90.0	---	---	3,855,705	3.5	7,280,191	6.5	111,609,719
1954	80,327,494	91.0	---	---	2,584,104	2.9	5,436,054	6.1	88,311,652
1955	105,359,417	90.0	307,279	---	3,319,517	2.8	8,049,872	7.2	117,036,085
1956	102,840,585	89.2	506,338	---	3,227,907	2.8	8,641,229	8.0	115,216,149
1957	101,657,776	90.2	611,508	---	2,475,136	2.2	7,970,574	7.6	112,714,996
1958	75,879,394	89.0	1,323,361	1.5	1,395,985	1.6	6,656,145	7.9	85,254,885
1959	81,868,987	87.3	1,864,338	2.0	1,380,283	1.5	8,532,514	9.2	93,446,132
1960	96,367,506	87.0	3,346,150	3.3	1,189,196	1.5	8,378,743	9.2	99,281,601
1961	84,502,071	86.2	3,967,158	4.0	881,080	.89	8,664,203	8.9	98,014,492
1962	82,957,318	84.8	5,552,697	5.2	804,964	.8	9,012,806	9.2	98,327,785
1963	88,833,985	81.3	8,544,078	7.8	982,659	.9	10,920,287	10.0	109,260,949
1964	98,097,499	77.2	15,442,186	12.2	857,586	0.6	12,678,496	10.0	127,075,767
1965	94,193,225	71.7	22,878,805	17.4	585,965	0.4	13,803,806	10.5	131,461,801
1966	85,024,572	63.4	33,928,374	25.4	278,119	0.2	14,870,363	11.0	134,101,428
1967	70,890,028	55.6	41,434,350	32.5	**	**	15,088,545	11.9	127,212,923
1968	65,836,000	50.1	48,812,000	37.2	**	**	16,814,000	12.7	131,462,000
1969	60,894,041	43.1	60,235,671	42.7	**	**	20,131,950	14.2	141,261,662
1970	48,022,000	36.6	63,330,000	48.2	**	**	20,162,000	15.2	131,514,000
1971	35,559,000	29.5	63,943,000	53.1	**	**	20,941,000	17.4	120,443,000
1972	34,936,000	26.2	74,584,000	56.0	**	**	23,721,000	17.8	133,241,000
1973	39,780,000	26.4	83,260,000	55.2	**	**	27,759,000	18.4	150,799,000
1974	35,499,000	24.3	81,552,000	56.0	**	**	28,889,000	19.7	145,720,000
1975	22,161,000	19.1	71,801,000	61.5	**	**	22,680,000	19.4	116,642,000
1976	23,470,000	18.3	79,916,000	62.4	**	**	24,612,000	19.3	128,000,000
1977	20,043,000	16.0	77,408,000	61.8	---	---	27,882,000	22.2	125,333,000
1978	21,310,000	15.5	83,464,000	61.0	---	---	32,287,000	23.5	137,031,000
1979	19,158,000	14.0	83,256,000	61.0	---	---	33,927,000	23.0	136,341,000
1980	13,054,000	11.7	67,615,000	60.4	---	---	31,166,000	27.9	111,835,000
1981	13,452,000	11.1	73,231,000	60.6	---	---	34,145,000	20.3	120,828,000
1982††	---	---	---	---	---	---	---	---	73,000,000

*Includes very small tonnages of crucible steel. †† IRON AGE estimate. Source: American Iron & Steel Institute.
**Included in openhearth since 1966. † Steel in first solid state after melting suitable for further processing or sale, including ingots, steel castings and strand or pressure cast blooms, billets, slabs, or other product forms.

U.S. Raw Steel Production, Rate of Capability Utilization

	1964†	1965	1966††	1967		1968	1969	1970	1971	1972	1973	1974		1975†††	1976	1977	1978	1979	1980	1981	1982
Jan.	115.5	143.4	97.9	98.4	Jan.	111.2	102.6	104.1	104.3	92.6	114.5	117.8	Jan.	90.4	74.4	66.8	77.2	83.5	82.7	79.9	59.3
Feb.	122.9	145.8	105.0	102.9	Feb.	116.7	111.8	107.6	111.4	98.7	119.1	118.8	Feb.	93.8	80.1	72.1	80.1	87.9	85.3	83.7	60.9
Mar.	127.2	149.7	111.8	101.5	Mar.	117.7	114.8	110.0	117.0	107.3	121.1	118.1	Mar.	93.4	85.4	81.2	83.1	94.5	88.4	88.6	61.7
Apr.	132.3	149.9	110.6	99.0	Apr.	119.1	116.1	108.9	120.2	110.8	122.3	119.0	Apr.	84.9	88.4	83.3	88.5	93.4	83.0	87.7	55.2
May	134.1	145.6	112.8	97.9	May	117.5	114.4	107.1	119.6	110.5	121.9	118.0	May	75.9	90.8	88.1	91.5	94.8	89.6	86.2	50.9
June	127.6	145.2	109.1	91.6	June	113.9	113.0	108.3	109.9	105.0	119.4	116.5	June	69.6	89.7	84.9	91.1	93.7	58.4	81.5	47.7
July	122.5	140.0	99.9	89.0	July	106.0	105.2	99.8	92.0	95.7	113.8	112.5	July	65.1	84.8	76.7	85.1	89.9	53.1	77.6	43.8
Aug.	127.5	137.3	102.7	95.3	Aug.	82.9	105.7	99.6	53.4	100.4	112.7	109.6	Aug.	67.3	82.8	77.2	86.3	86.0	54.8	77.3	42.4
Sept.	133.6	124.6	107.9	99.8	Sept.	77.3	110.2	102.6	73.4	104.4	117.0	113.3	Sept.	74.7	80.4	77.2	86.6	82.8	62.7	75.9	41.9
Oct.	140.2	112.7	106.5	103.4	Oct.	83.4	114.1	99.0	76.0	107.9	119.2	116.8	Oct.	69.0	75.6	77.7	86.1	84.4	72.2	68.7	40.2
Nov.	141.4	110.5	104.1	108.1	Nov.	91.7	114.0	95.7	77.0	109.0	120.4	111.1	Nov.	67.4	72.2	75.0	89.4	80.6	79.5	62.8	34.6*
Dec.	140.7	116.7	96.6	110.6	Dec.	96.5	109.3	96.6	81.3	109.9	117.7	101.4	Dec.	66.2	67.8	74.7	87.7	78.0	77.8	58.6	32.00*
Average	130.5	135.3	105.6	100.0	Average	103.1	111.0	103.4	94.7	104.5	118.5	114.5	Average	76.2	80.9	78.4	86.8	87.8	72.8	78.3	47.6*

*Estimate. †AISI Index of Production (1957-1950=100). ††Production index 1967=100, revised back to 1966 in Jan. 1971.
†††Rate of Capability Utilization, begun January, 1976, revised back to January, 1975.

Source: AISI

U.S. Monthly Raw Steel† Production, Millions of Tons

	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
Jan.	11,008,762	6,753,912	9,317,385	12,049,404	6,416,004	10,352,748	8,390,914	9,526,000	11,830,469	10,577,000	10,633,000	12,014,599	11,083,447
Feb.	9,987,206	5,782,323	9,602,938	11,126,806	6,739,098	9,698,316	8,222,352	9,485,359	10,865,869	10,249,000	10,041,000	11,794,896	10,915,021
Mar.	10,599,074	6,254,622	11,567,745	11,564,883	7,086,389	10,583,943	10,080,014	10,496,987	12,346,963	12,083,000	10,963,000	12,721,053	12,400,375
Apr.	9,814,780	5,532,991	11,281,920	9,777,857	7,584,687	9,235,881	10,695,362	10,560,651	11,966,162	11,570,000	10,349,000	12,450,040	12,142,751
May	9,782,323	6,201,159	11,600,581	8,830,472	8,980,626	7,535,506	11,489,524	11,060,357	12,012,449	12,191,000	10,577,000	12,700,325	12,356,384
June	9,391,402	7,127,480	10,907,634	7,404,873	8,551,856	6,891,785	10,365,154	10,184,634	11,593,450	11,403,000	9,576,000	11,905,936	11,810,287
July	8,908,732	6,420,405	5,227,129	6,350,924	8,091,956	6,174,187	8,653,544	10,105,609	11,550,988	10,791,000	9,620,000	11,452,388	11,365,146
Aug.	9,233,732	7,286,003	1,439,277	6,838,000	8,660,527	7,097,916	7,781,560	10,515,268	11,324,149	11,097,000	10,300,000	8,955,712	11,420,995
Sept.	8,977,906	7,810,372	1,535,017	6,458,421	8,904,000	7,251,023	7,858,009	10,668,978	9,949,355	11,280,000	10,438,000	8,085,770	11,523,106
Oct.	9,197,717	8,839,778	1,704,533	6,868,380	9,173,170	7,780,538	8,483,160	11,568,246	9,295,828	11,509,000	11,171,000	9,006,237	12,323,544
Nov.	8,392,919	8,599,318	7,267,607	6,171,940	8,745,966	7,846,057	8,488,239	11,292,070	8,822,186	10,887,000	11,299,000	9,590,000	11,916,305
Dec.	7,420,285	8,710,522	11,989,319	5,839,841	9,568,954	8,079,885	8,753,117	11,611,606	9,627,156	10,435,000	11,953,000	10,421,000	11,812,097
Total	112,714,996	85,254,895	93,448,132	99,281,601	98,814,492	98,327,785	109,208,949	127,875,767	131,481,601	134,101,000	127,213,000	131,662,000	141,261,662

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
Jan.	11,242,855	11,273,740	10,001,028	12,372,882	12,726,000	11,584,190	9,834,725	9,089,254	10,301,277	11,104,826	10,700,736	10,590,135	7,737,389
Feb.	10,498,356	10,874,377	9,979,752	11,625,734	11,598,000	10,861,663	9,906,523	8,858,898	9,643,242	10,562,363	10,331,868	10,028,344	7,177,979
Mar.	11,885,561	12,645,241	11,587,946	13,088,378	12,756,000	11,980,244	11,294,279	11,049,228	11,082,583	12,575,987	11,438,944	11,744,370	8,048,621
Apr.	11,385,675	12,564,686	11,587,706	12,788,629	12,442,000	10,667,492	11,439,185	11,166,557	11,526,367	12,195,612	10,658,202	11,242,726	7,005,717
May	11,574,485	12,920,415	11,936,558	13,174,088	12,752,000	9,863,557	12,136,009	12,200,852	12,320,398	12,788,673	9,225,991	11,422,988	6,678,457
June	11,323,086	11,490,602	10,979,970	12,487,656	12,185,000	8,743,842	11,604,506	11,363,812	11,660,523	12,229,990	7,500,772	10,451,364	6,050,062
July	10,780,960	9,942,264	10,341,230	12,290,250	12,155,000	8,370,426	11,399,954	10,319,277	11,387,671	11,821,349	6,795,726	10,159,544	5,718,617
Aug.	10,764,738	5,773,736	10,842,279	12,181,330	11,837,000	8,548,260	11,128,102	10,392,460	11,549,515	11,309,493	7,018,547	10,120,254	5,537,970
Sept.	10,726,618	7,678,110	10,912,540	12,229,008	11,849,000	9,295,321	10,462,577	10,050,311	11,467,224	10,541,320	7,766,905	9,618,072	5,298,622
Oct.	10,698,720	8,211,000	11,656,841	12,875,791	12,617,045	9,213,736	10,278,000	10,442,000	12,105,000	10,809,966	9,442,103	9,002,756	5,262,370
Nov.	10,008,000	8,053,140	11,398,316	12,586,509	11,614,000	8,709,090	9,494,000	9,748,000	11,654,000	9,997,000	10,057,000	7,962,000	4,685,000*
Dec.	10,438,000	8,783,805	11,878,199	12,721,577	10,960,000	8,845,511	9,215,000	10,031,000	11,812,000	9,996,000	10,180,000	7,671,000	4,685,000*
Total	131,514,000	125,442,525	133,241,185	150,798,527	145,729,045	118,783,332	128,008,000	125,333,000	137,631,000	136,341,000	111,835,000	128,829,000	73,000,000*

*Estimate
† Steel in first solid state after melting suitable for further processing or sale, including ingots, steel castings and continuous or pressure cast blooms, billets, slabs, or other product forms.

Source: American Iron and Steel Institute

Steel Prices

Composite Prices by Periods

Period	Cents per Pound
Dec. 6, 1976 to Dec. 13, 1976	14.896
Dec. 13, 1976 to June 27, 1977	15.146
June 27, 1977 to Sept. 5, 1977	15.941
Sept. 5, 1977 to Jan. 30, 1978	16.043
Jan. 30, 1978 to Feb. 27, 1978	17.301
Feb. 27, 1978 to April 3, 1978	17.393
April 3, 1978 to April 17, 1978	17.672
April 17, 1978 to July 31, 1978	17.670
July 31, 1978 to Dec. 31, 1978	18.719
Jan. 1, 1979 to April 1, 1979	19.549
April 1, 1979 to May 13, 1979	19.806
May 13, 1979 to July 1, 1979	19.668
July 1, 1979 to July 9, 1979	20.095
July 9, 1979 to Oct. 1, 1979	20.311
Oct. 1, 1979 to Jan. 6, 1980	20.547
Jan. 7, 1980 to Mar. 1, 1980	21.038
Mar. 2, 1980 to Mar. 9, 1980	21.130
Mar. 10, 1980 to Mar. 31, 1980	21.180
Apr. 1, 1980 to July 6, 1980	21.739
July 7, 1980 to Oct. 4, 1980	21.736
Oct. 5, 1980 to Nov. 30, 1980	22.019
Dec. 1, 1980 to Dec. 31, 1980	22.286
Jan. 1, 1981 to Feb. 1, 1981	22.901
Feb. 2, 1981 to Feb. 28, 1981	23.362
Mar. 1, 1981 to Mar. 28, 1981	23.598
Mar. 29, 1981 to June 20, 1981	23.776
June 21, 1981 to Sept. 26, 1981	24.486
Sept. 27, 1981 to April 3, 1982	25.195
April 4, 1982 to Dec. 31, 1982	25.297

The Iron Age Finished Steel Composite Price

	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972
January	6.196	6.368	6.368	6.368	6.445	6.545	6.794	7.263	7.838	9.014
February	6.196	6.368	6.368	6.368	6.448	6.545	6.904	7.351	7.838	8.998
March	6.196	6.368	6.368	6.383	6.448	6.545	6.961	7.434	8.012	8.998
April	6.196	6.368	6.368	6.383	6.448	6.545	6.961	7.504	8.055	8.998
May	6.279	6.368	6.368	6.383	6.448	6.545	7.042	7.560	8.055	8.998
June	6.279	6.368	6.368	6.376	6.448	6.545	7.042	7.813	8.234	8.998
July	6.279	6.368	6.368	6.376	6.448	6.545	7.125	7.813	8.480	8.998
August	6.279	6.368	6.368	6.376	6.448	6.767	7.252	7.813	8.728	8.998
September	6.279	6.368	6.368	6.433	6.485	6.767	7.252	7.813	8.977	8.998
October	6.368	6.368	6.368	6.445	6.496	6.767	7.252	7.813	8.977	8.998
November	6.368	6.368	6.368	6.445	6.496	6.538	7.252	7.813	8.977	8.998
December	6.368	6.368	6.368	6.445	6.510	6.538	7.263	7.813	8.977	8.998
Average	6.273	6.368	6.368	6.399	6.464	6.600	7.091	7.650	8.429	8.998

	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
January	9.363	9.456	12.739	13.693	15.146	16.294	19.549	20.943	22.901	25.195
February	9.363	9.480	12.928	13.693	15.146	17.324	19.549	21.038	23.362	25.195
March	9.363	9.480	12.928	13.693	15.146	17.393	19.549	21.168	23.598	25.195
April	9.363	10.033	12.928	13.693	15.146	17.670	19.606	21.739	23.776	25.297
May	9.363	10.033	12.928	13.835	15.146	17.670	19.637	21.739	23.776	25.297
June	9.363	11.108	12.920	14.186	15.146	17.670	19.668	21.739	24.232	25.297
July	9.363	12.075	12.912	14.502	15.941	17.670	20.253	21.736	24.468	25.297
August	9.363	12.346	12.912	14.598	15.941	18.719	20.311	21.736	24.468	25.297
September	9.363	12.369	12.961	14.598	16.043	18.719	20.311	21.736	24.486	25.297
October	9.432	12.433	13.692	14.598	16.043	18.719	20.547	21.982	25.195	25.297
November	9.432	12.433	13.693	14.598	16.043	18.719	20.547	22.019	25.195	25.297
December	9.432	12.433	13.693	14.880	16.043	18.719	20.547	22.286	25.195	25.297
Average	9.380	11.141	13.102	14.213	15.577	17.940	20.006	21.655	24.224	25.271

Tinplate

Single Reduced, 70 lb.
Dollars Per Base Box, Pittsburgh

	1969	1970	1971	1972	1973	1974	1975
Jan	$7.70	$7.70	$8.85	$9.35	$9.35	$9.75	$13.70
Feb	7.70	7.70	8.85	9.35	9.35	9.75	13.70
Mar	7.70	7.70	8.85	9.35	9.75	10.15	13.70
Apr	7.70	7.95	8.85	9.35	9.75	10.15	13.70
May	7.70	8.20	8.85	9.35	9.75	10.15	13.70
June	7.70	8.20	8.85	9.35	9.75	11.30	13.70
July	7.70	8.20	8.85	9.35	9.75	11.30	13.30
Aug	7.70	8.20	8.85	9.35	9.75	11.30	13.70
Sept	7.70	8.20	8.85	9.35	9.75	11.30	13.70
Oct	7.70	8.55	8.85	9.35	9.75	11.30	13.70
Nov	7.70	8.55	8.85	9.35	9.75	13.45	13.70
Dec	7.70	8.55	8.85	9.35	9.75	13.45	13.70
Average	7.70	8.22	8.85	9.35	9.68	11.11	13.70

	1976	1977	1978	1979	1980	1981	1982
Jan	$13.70	$15.10	$17.05	$19.01	$21.93	$24.94	$26.29
Feb	13.70	15.10	17.05	19.27	21.93	24.94	26.29
Mar	15.10	15.75	17.80	19.27	21.93	24.94	26.29
Apr	15.10	15.75	17.80	20.57	23.31	24.94	26.29
May	15.10	15.75	18.00	20.57	23.31	24.94	26.29
June	15.10	15.75	18.00	20.57	23.31	24.94	26.29
July	15.10	15.75	18.00	20.57	23.31	24.94	26.29
Aug	15.10	15.75	18.00	20.57	21.31	24.94	26.29
Sept	15.10	17.05	18.00	20.57	21.31	24.94	26.29
Oct	15.10	17.05	19.10	21.93	21.31	24.94	26.29
Nov	15.10	17.05	19.10	21.93	21.31	24.94	26.29
Dec	15.10	17.05	19.10	21.93	21.31	24.94	26.29
Average	14.86	16.07	18.08	20.57	22.89	24.94	26.29

Galvanized Sheets

At Pittsburgh, Cents Per Pound†

	1971	1972	1973	1974	1975	1976
Jan	9.35	10.875	10.525	10.80	14.05	15.40
Feb	9.35	10.525	10.525	10.80	14.05	15.40
Mar	9.35	10.525	10.525	10.80	14.05	15.40
Apr	9.35	10.525	10.525	10.80	14.05	15.40
May	9.35	10.525	10.525	12.15	14.05	15.40
June	9.35	10.525	10.525	12.15	14.05	16.40
July	10.00	10.525	10.525	14.05	14.05	16.40
Aug	10.00	10.525	10.525	14.05	14.05	16.40
Sept	10.00	10.525	10.525	14.05	14.05	16.40
Oct	10.00	10.525	10.80	14.05	15.40	16.40
Nov	10.00	10.525	10.80	14.05	15.40	16.40
Dec	10.00	10.525	10.80	14.05	15.40	17.40
Average	9.68	10.554	10.50	12.65	14.39	16.07

	1977	1978	1979	1980	1981	1982
Jan	17.40	18.60	21.95	22.85	25.25	26.25
Feb	17.40	19.80	21.95	22.85	25.25	26.25
Mar	17.40	19.80	21.95	22.85	25.25	26.25
Apr	17.40	19.80	21.95	23.80	25.25	26.25
May	17.40	20.075	21.95	23.80	25.25	26.25
June	17.40	20.075	21.95	23.80	26.20	26.25
July	18.60	20.075	21.95	23.80	27.15	26.25
Aug	18.60	20.80	22.85	23.80	27.15	26.25
Sept	18.60	20.80	22.85	23.80	27.15	26.25
Oct	18.60	20.80	22.85	23.80	27.15	26.25
Nov	18.60	20.80	22.85	23.80	27.15	26.25
Dec	18.60	20.80	22.85	23.80	27.15	26.25
Average	18.00	20.18	22.32	23.56	26.30	26.25

†Hot-Dipped, 10 ga.

Hot-Rolled Strip

At Pittsburgh, Cents Per Pound

	1971	1972	1973	1974	1975	1976
Jan	7.30	8.40	8.15	8.375	11.00	11.70
Feb	7.30	8.15	8.15	8.375	11.00	11.70
Mar	7.30	8.15	8.15	8.375	11.00	11.70
Apr	7.30	8.15	8.15	8.375	11.00	11.70
May	7.30	8.15	8.15	9.50	11.00	11.70
June	7.30	8.15	8.15	9.50	11.00	11.70
July	7.75	8.15	8.15	11.00	11.00	12.45
Aug	7.75	8.15	8.15	11.00	11.00	12.45
Sept	7.75	8.15	8.15	11.00	11.00	12.45
Oct	7.75	8.15	8.375	11.00	11.70	12.45
Nov	7.75	8.15	8.375	11.00	11.70	12.45
Dec	7.75	8.15	8.375	11.00	11.70	13.25
Average	7.53	8.17	8.206	9.875	11.17	12.15

	1977	1978	1979	1980	1981	1982
Jan	13.25	14.175	16.60	17.50	19.50	20.80
Feb	13.25	14.175	16.60	17.50	19.50	20.80
Mar	13.25	14.175	16.60	17.50	19.50	20.80
Apr	13.25	14.175	16.60	18.45	19.50	20.80
May	13.25	15.275	16.60	18.45	19.50	20.80
June	13.25	15.275	16.60	18.45	20.15	20.80
July	14.175	15.275	16.60	18.45	20.80	20.80
Aug	14.175	15.80	17.50	18.45	20.80	20.80
Sept	14.175	15.80	17.50	18.45	20.80	20.80
Oct	14.175	15.80	17.50	18.45	20.80	20.80
Nov	14.175	15.80	17.50	18.45	20.80	20.80
Dec	14.175	15.80	17.50	18.45	20.80	20.80
Average	13.70	14.79	16.97	18.21	20.20	20.80

Hot-Rolled Sheets

At Pittsburgh, Cents Per Pound

	1971	1972	1973	1974	1975	1976
Jan	7.50	8.60	8.35	8.55	11.00	11.70
Feb	7.50	8.35	8.35	8.55	11.00	11.70
Mar	7.50	8.35	8.35	8.55	11.00	11.70
Apr	7.50	8.35	8.35	8.55	11.00	11.70
May	7.50	8.35	8.35	9.55	11.00	11.70
June	7.50	8.35	8.35	9.55	11.00	11.70
July	7.95	8.35	8.35	11.00	11.00	12.45
Aug	7.95	8.35	8.35	11.00	11.00	12.45
Sept	7.95	8.35	8.35	11.00	11.00	12.45
Oct	7.95	8.35	8.55	11.00	11.70	12.45
Nov	7.95	8.35	8.55	11.00	11.70	12.45
Dec	7.95	8.35	8.55	11.00	11.70	13.25
Average	7.73	8.37	8.40	9.94	11.17	12.14

	1977	1978	1979	1980	1981	1982
Jan	13.25	14.175	16.60	17.50	19.50	20.80
Feb	13.25	14.175	16.60	17.50	19.50	20.80
Mar	13.25	14.175	16.60	17.50	19.50	20.80
Apr	13.25	14.175	16.60	18.45	19.50	20.80
May	13.25	15.275	16.60	18.45	19.50	20.80
June	13.25	15.275	16.60	18.45	20.15	20.80
July	14.175	15.275	16.60	18.45	20.80	20.80
Aug	14.175	15.80	17.50	18.45	20.80	20.80
Sept	14.175	15.80	17.50	18.45	20.80	20.80
Oct	14.175	15.80	17.50	18.45	20.80	20.80
Nov	14.175	15.80	17.50	18.45	20.80	20.80
Dec	14.175	15.80	17.50	18.45	20.80	20.80
Average	13.712	15.12	16.97	18.21	20.20	20.80

Cold-Rolled Sheets

At Pittsburgh, Cents Per Pound

	1971	1972	1973	1974	1975	1976
Jan	8.95	9.25	10.075	10.30	13.00	13.90
Feb	8.95	10.075	10.075	10.30	13.00	13.90
Mar	8.95	10.075	10.075	10.30	13.00	13.90
Apr	8.95	10.075	10.075	10.30	13.00	13.90
May	8.95	10.075	10.075	11.30	13.00	13.90
June	8.95	10.075	10.075	11.30	13.00	13.90
July	9.55	10.075	10.075	13.00	13.00	14.80
Aug	9.55	10.075	10.075	13.00	13.00	14.80
Sept	9.55	10.075	10.075	13.00	13.00	14.80
Oct	9.55	10.075	10.30	13.00	13.90	14.80
Nov	9.55	10.075	10.30	13.00	13.90	14.80
Dec	9.55	10.075	10.30	13.00	13.90	15.80
Average	9.25	9.312	10.13	11.82	13.22	14.43

	1977	1978	1979	1980	1981	1982
Jan	15.80	16.90	19.75	20.75	23.15	24.65
Feb	15.80	16.90	19.75	20.75	23.15	24.65
Mar	15.80	16.90	19.75	20.75	23.15	24.65
Apr	15.80	16.90	19.75	21.90	23.15	24.65
May	15.80	18.175	19.75	21.90	23.15	24.65
June	15.80	18.175	19.75	21.90	23.90	24.65
July	16.90	18.175	19.75	21.90	24.65	24.65
Aug	16.90	18.80	20.75	21.90	24.65	24.65
Sept	16.90	18.80	20.75	21.90	24.65	24.65
Oct	16.90	18.80	20.75	21.90	24.65	24.65
Nov	16.90	18.80	20.75	21.90	24.65	24.65
Dec	16.90	18.80	20.75	21.90	24.65	24.65
Average	16.55	17.17	20.16	21.62	23.96	24.65

Structural Steel Shapes

At Pittsburgh, Cents Per Pound

	1971	1972	1973	1974	1975	1976
Jan	6.90	8.10	8.50	8.50	11.80	12.55
Feb	6.90	8.10	8.50	8.50	11.80	12.55
Mar	7.40	8.10	8.50	9.05	11.80	12.55
Apr	7.40	8.10	8.50	9.80	11.80	12.55
May	7.40	8.10	8.50	9.80	11.80	12.55
June	7.40	8.10	8.50	9.80	11.80	12.55
July	8.10	8.10	8.50	10.80	11.80	13.55
Aug	8.10	8.10	8.50	11.30	11.80	13.55
Sept	8.10	8.10	8.50	11.30	11.80	13.55
Oct	8.10	8.10	8.50	11.30	12.55	13.55
Nov	8.10	8.10	8.50	11.30	12.55	13.55
Dec	8.10	8.10	8.50	11.30	12.55	13.55
Average	7.67	8.10	8.50	10.23	11.90	13.05

	1977	1978	1979	1980	1981	1982
Jan	13.55	14.55	17.00	18.00	19.90	22.90
Feb	13.55	14.55	17.00	18.00	19.90	22.90
Mar	13.55	14.55	17.00	18.90	19.90	22.90
Apr	13.55	14.55	17.00	18.90	21.65	23.90
May	13.55	15.725	17.15	18.90	21.65	23.90
June	13.55	15.725	17.30	18.90	21.65	23.90
July	13.55	15.725	17.30	18.90	21.65	23.90
Aug	13.55	16.25	17.30	18.90	21.65	23.90
Sept	14.55	16.25	17.30	18.90	21.65	23.90
Oct	14.55	16.25	18.00	19.90	22.90	23.90
Nov	14.55	16.25	18.00	19.90	22.90	23.90
Dec	14.55	16.25	18.00	19.90	22.90	23.90
Average	13.88	15.58	17.36	19.00	21.52	23.65

Composite Pig Iron Price

Average of Iron Age quotes on basic and foundry iron per net ton.

	1977	1978	1979	1980	1981	1982
Jan	$187.67	$191.75	$203.00	$203.00	$203.00	$213.00
Feb	187.67	191.75	203.00	203.00	203.00	213.00
Mar	187.67	191.75	203.00	203.00	203.00	213.00
Apr	187.67	191.75	203.00	203.00	203.00	213.00
May	187.67	191.75	203.00	203.00	203.00	213.00
June	187.67	203.00	203.00	203.00	203.00	213.00
July	187.67	203.00	203.00	203.00	203.00	213.00
Aug	191.75	203.00	203.00	203.00	203.00	213.00
Sept	191.75	203.00	203.00	203.00	203.00	213.00
Oct	191.75	203.00	203.00	203.00	203.00	213.00
Nov	191.75	203.00	203.00	203.00	213.00	213.00
Dec	191.75	203.00	203.00	203.00	213.00	213.00
Average	$189.57	$198.31	$203.00	$203.00	$204.66	$213.00

Special Quality Bars

At Pittsburgh, Cents Per Pound

	1977	1978	1979	1980	1981	1982
Jan	15.10	16.15	19.10	21.00	22.80	23.95
Feb	15.10	16.15	19.10	21.00	22.80	23.95
Mar	15.10	16.15	19.10	21.00	22.80	23.95
Apr	15.10	16.15	19.10	21.00	22.80	23.95
May	15.10	17.525	19.10	21.00	22.80	23.95
June	15.10	17.525	19.10	21.00	23.95	23.95
July	16.15	17.525	19.10	21.00	23.95	23.95
Aug	16.15	18.15	19.85	21.00	23.95	23.95
Sept	16.15	18.15	19.85	21.00	23.95	23.95
Oct	16.15	18.15	19.85	21.00	23.95	23.95
Nov	16.15	18.15	19.85	22.80	23.95	23.95
Dec	16.15	18.15	19.85	22.80	23.95	23.95
Average	15.62	17.33	19.41	21.30	23.29	23.95

Steel Plates

At Pittsburgh, Cents Per Pound

	1977	1978	1979	1980	1981	1982
Jan	14.10	15.10	17.85	19.45	21.50	24.25
Feb	14.10	15.10	17.85	19.45	21.50	24.25
Mar	14.10	15.10	17.85	19.45	23.25	24.25
Apr	14.10	15.10	17.85	20.70	23.25	24.25
May	14.10	16.425	18.17	20.70	23.25	24.25
June	14.10	16.425	18.50	20.70	23.25	24.25
July	15.10	16.425	18.50	20.70	23.25	24.25
Aug	15.10	17.05	18.50	20.70	23.25	24.25
Sept	15.10	17.05	18.50	20.70	23.25	24.25
Oct	15.10	17.05	19.45	21.50	24.25	24.25
Nov	15.10	17.05	19.45	21.50	24.25	24.25
Dec	15.10	17.05	19.45	21.50	24.25	24.25
Average	14.60	16.24	18.49	20.62	23.20	24.25

Steel Scrap

Philadelphia

*Estimate

Prices of No. 1 Scrap, Per Gross Ton

	1977	1978	1979	1980	1981	1982
Jan	$74.50	$68.70	$101.10	$100.50	$95.75	$75.25
Feb	74.50	72.75	110.75	108.00	91.50	75.50
Mar	74.00	76.00	110.25	101.50	91.50	72.90
Apr	71.50	74.75	97.70	92.75	90.00	71.50
May	64.50	71.10	90.75	82.50	84.50	65.00
June	62.50	74.30	93.08	76.10	79.50	60.30
July	61.75	78.00	91.50	83.00	79.50	59.50
Aug	61.10	78.00	89.25	88.25	79.30	59.50
Sept	59.00	75.50	88.50	91.90	78.50	59.50
Oct	48.10	76.30	87.30	91.50	69.50	57.00
Nov	50.25	84.00	88.50	91.50	66.50	54.70
Dec	56.00	91.50	92.70	96.50	66.50	54.50*
Average	63.14	76.74	95.10	92.00	81.05	63.76*

No. 2 Bundles

*Estimate

	1977	1978	1979	1980	1981	1982
Jan	$48.50	$46.90	$60.10	$72.00	$64.00	$43.50
Feb	46.50	51.25	66.50	76.25	60.75	43.50
Mar	48.50	53.50	72.25	71.50	60.50	43.50
Apr	48.50	51.75	62.70	64.75	60.50	41.50
May	48.10	47.30	64.50	53.25	57.50	40.50
June	45.50	50.10	66.50	51.10	54.50	40.10
July	45.50	51.50	66.50	56.00	54.50	39.50
Aug	45.30	51.50	61.50	63.00	54.30	39.50
Sept	44.50	49.50	59.25	65.10	51.50	39.50
Oct	34.70	48.70	58.50	64.50	46.00	39.50
Nov	34.75	55.50	60.00	64.50	39.30	39.50
Dec	38.50	56.50	66.30	63.50	37.50	39.50*
Average	44.23	51.17	63.71	63.93	53.41	40.80*

Chicago

*Estimate

Prices of No. 1 Scrap, Per Gross Ton

	1977	1978	1979	1980	1981	1982
Jan	$69.50	$71.50	$ 98.30	$ 96.50	$ 95.50	$83.25
Feb	69.50	71.50	109.75	100.50	101.25	79.50
Mar	71.00	72.25	121.25	96.50	108.10	71.70
Apr	70.25	76.00	99.30	86.00	104.50	67.00
May	64.10	71.50	99.75	70.50	96.75	58.50
June	58.75	75.30	104.00	63.50	88.50	52.30
July	57.50	77.75	96.90	67.50	88.50	49.50
Aug	57.50	74.00	88.25	77.50	97.50	50.70
Sept	55.00	69.50	86.50	88.50	91.25	51.50
Oct	47.30	72.50	87.30	93.75	81.00	46.50
Nov	45.75	83.00	94.50	98.75	75.50	46.50
Dec	62.25	91.25	93.90	105.10	75.50	48.50*
Average	60.70	75.50	98.30	87.05	91.99	58.62*

No. 2 Bundles

*Estimate

	1977	1978	1979	1980	1981	1982
Jan	$47.50	$46.50	$64.50	$54.50	$77.00	$85.50
Feb	47.75	46.75	67.50	58.50	80.25	62.50
Mar	48.75	48.50	68.75	57.50	83.70	56.50
Apr	48.50	51.50	59.90	53.25	83.25	52.50
May	43.30	51.10	63.00	49.50	73.25	47.50
June	39.75	49.30	61.50	48.30	64.50	43.90
July	37.50	50.00	53.50	51.50	65.75	41.50
Aug	38.90	48.00	49.50	61.50	68.70	41.50
Sept	38.50	46.50	50.25	72.10	69.00	41.50
Oct	34.70	48.50	52.50	81.75	60.50	38.50
Nov	34.75	54.50	56.50	87.50	60.50	38.50
Dec	44.00	59.75	57.30	86.50	63.25	38.50*
Average	41.99	50.07	58.72	63.24	70.81	47.36*

Pittsburgh

*Estimate

Prices of No. 1 Scrap, Per Gross Ton

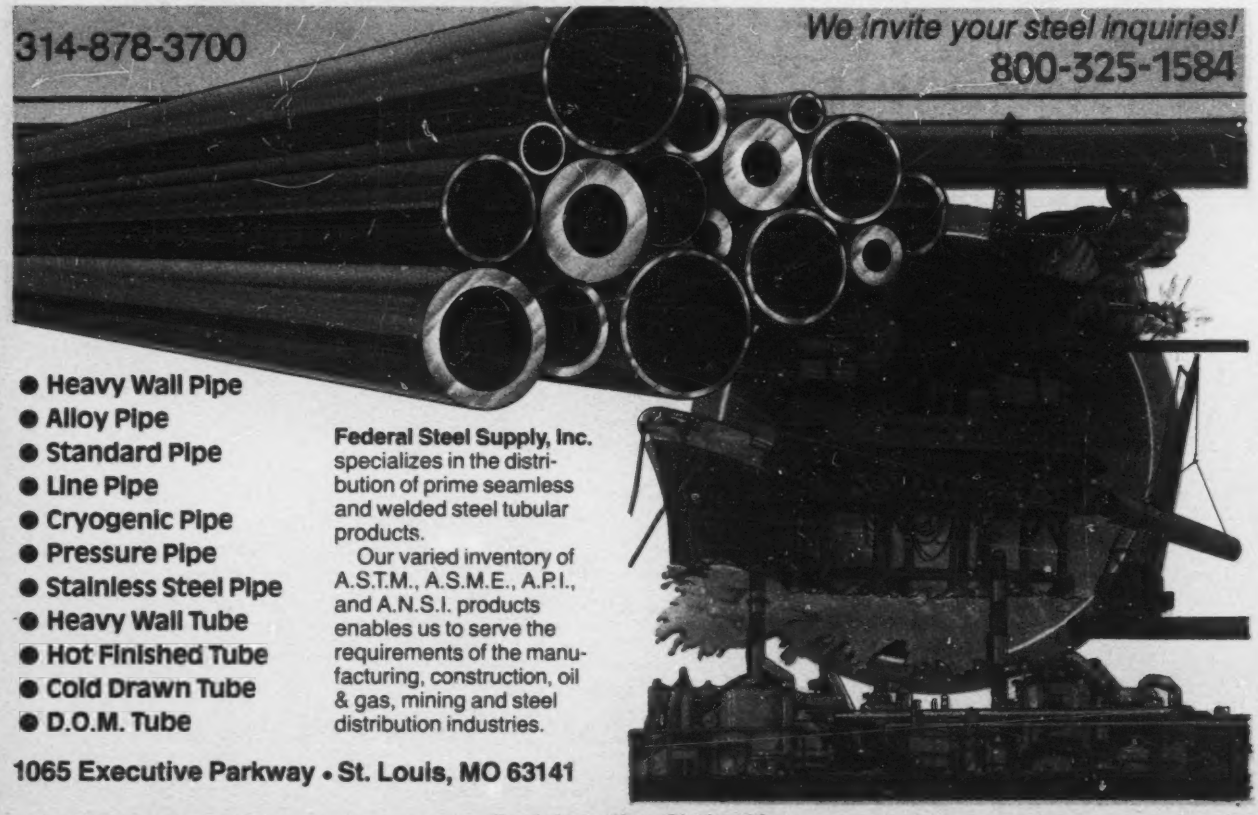
	1977	1978	1979	1980	1981	1982
Jan	$72.50	$71.50	$ 93.30	$102.00	$104.50	$94.50
Feb	73.00	72.00	111.75	106.50	105.75	91.50
Mar	75.50	74.50	127.75	105.50	116.10	85.90
Apr	74.00	77.50	102.90	98.00	110.75	75.50
May	67.30	73.10	102.75	79.50	105.10	64.50
June	64.50	74.70	105.50	69.50	100.00	61.50
July	64.50	77.50	99.90	77.75	102.50	59.00
Aug	65.50	77.00	93.50	87.50	107.10	57.50
Sept	63.00	73.75	89.25	102.90	101.50	57.50
Oct	51.90	75.70	87.30	102.50	93.00	55.25
Nov	52.50	83.25	94.50	105.25	84.90	52.50
Dec	63.50	87.00	95.70	103.10	87.25	52.50*
Average	65.64	76.45	100.34	95.00	101.54	67.30*

No. 2 Bundles

*Estimate

	1977	1978	1979	1980	1981	1982
Jan	$51.90	$50.30	$60.10	$61.00	$74.50	$60.50
Feb	50.00	49.75	70.50	67.50	74.50	62.50
Mar	53.00	49.50	78.75	68.70	77.30	53.70
Apr	53.75	50.25	67.70	64.50	81.50	48.75
May	46.90	47.10	69.75	58.75	73.50	46.50
June	42.50	47.70	74.50	52.70	65.70	44.50
July	42.50	52.00	68.30	54.50	64.50	44.50
Aug	46.50	49.75	64.75	63.50	64.50	44.50
Sept	42.50	46.50	62.75	66.50	64.50	42.50
Oct	38.90	46.30	59.30	66.50	63.00	40.25
Nov	38.50	51.00	59.25	69.75	60.50	38.10
Dec	46.50	55.25	59.50	73.90	60.50	37.50*
Average	46.12	49.61	66.26	63.98	68.71	46.98*

FEDERAL STEEL SUPPLY INC.



- Heavy Wall Pipe
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Scrap Composites

Average of Iron Age Scrap Prices Pittsburgh, Chicago, Philadelphia, Gross Ton

No. 1 Heavy Melting

*Estimate

	1977	1978	1979	1980	1981	1982
Jan	$72.17	$70.56	$ 97.56	$ 99.67	$ 98.58	$84.34
Feb	72.33	72.08	110.75	105.00	99.50	82.17
Mar	73.50	74.25	119.75	101.17	105.23	76.83
Apr	71.92	76.08	99.96	92.25	101.75	71.33
May	65.30	71.90	97.75	77.50	95.42	62.67
June	61.91	74.76	100.83	89.70	89.37	58.03
July	61.25	77.25	96.10	76.08	90.17	56.00
Aug	61.37	76.33	90.33	84.42	94.63	55.90
Sept	58.83	72.91	88.08	94.43	90.42	56.17
Oct	49.10	74.83	87.30	95.91	81.17	52.92
Nov	49.50	83.41	92.50	98.50	75.83	51.23
Dec	60.59	89.91	94.10	101.57	76.42	51.17*
Average	63.15	76.23	97.91	91.35	91.53	63.23*

No. 2 Bundles

*Estimate

	1977	1978	1979	1980	1981	1982
Jan	$49.30	$47.90	$61.56	$62.50	$71.83	$56.50
Feb	48.75	49.25	66.17	67.41	71.83	56.17
Mar	50.08	50.50	73.25	65.90	73.83	51.23
Apr	50.25	51.17	63.43	60.83	75.08	47.58
May	46.03	48.50	65.75	53.83	68.08	44.83
June	42.58	49.03	67.50	50.70	61.57	42.83
July	41.83	51.16	62.76	54.00	61.58	41.83
Aug	43.56	49.75	58.58	62.66	62.50	41.83
Sept	41.83	47.50	57.41	67.90	61.66	41.47
Oct	36.10	47.83	56.76	70.91	56.50	39.42
Nov	36.00	53.66	58.58	72.75	53.43	38.70
Dec	43.00	57.16	61.03	75.23	53.75	38.50*
Average	44.11	50.28	62.89	63.71	64.31	45.05*

Iron Ore

Pig Iron, Production

Net Tons

Year	Basic	Bessemer	Low phosphorous	Foundry	Malleable	All Other, incl. Direct Castings Silvery Pig Iron	Total Pig Iron
1971	77,341,000	1,215,000	145,000	1,214,000	1,336,000	48,000	81,299,000
1972	83,991,000	1,336,000	105,000	1,533,000	2,186,000	370,000	88,942,000
1973	96,202,000	1,242,000	101,000	1,561,000	1,352,000	359,000	100,837,000
1974	91,193,000	1,160,000	106,000	1,528,000	1,382,000	800,000	95,909,000
1975	75,911,000	1,087,000	140,000	1,321,000	814,000	650,000	79,923,000
1976	82,884,000	1,150,000	112,000	1,489,000	800,000	425,000	86,984,000
1977	78,198,000	254,000	122,000	1,810,000	990,000	454,000	81,328,000
1978	84,497,000	295,000	110,000	1,856,000	471,000	450,000	87,679,000
1979	84,047,000	12,000	178,000	1,457,000	1,003,000	306,000	87,003,000
1980	66,964,000	39,000	72,000	713,000	799,000	134,000	68,721,000
1981	71,166,000	58,000	132,000	1,221,000	929,000	66,000	73,750,000
1982†	.....	.....	.....	.....	.....	.....	48,000,000

†Iron Age estimate.

Source American Iron and Steel Institute

Supply of Iron Ore in the United States

Year	Domestic Shipments	Exports	Imports	Net Supply*
1974	85,112,000	2,323,235	48,029,108	130,817,873
1975	80,267,092	2,537,451	46,742,190	124,471,831
1976	86,646,674	2,997,333	43,933,333	127,582,674
1977	67,050,341	2,143,047	37,904,705	102,811,999
1978	83,207,000	4,213,194	33,616,378	112,610,184
1979	92,053,933	5,147,657	33,776,072	120,682,348
1980	72,628,819	5,689,198	25,058,200	91,997,821
1981	66,302,487	5,545,518	28,333,974	89,090,943
1982**	40,409,588	2,822,475	15,461,063	53,048,276

*Domestic shipments minus exports, plus imports. **Estimate

Source: American Iron Ore Association

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Nonferrous Prices and Production

U.S. Production of Primary Aluminum
Short tons

	1975	1976	1977	1978
Jan	304,126	322,411	399,030	399,874
Feb	324,361	302,791	351,686	366,437
Mar	347,202	326,210	379,025	395,209
Apr	326,035	324,859	371,310	387,324
May	327,153	349,672	382,489	405,317
June	301,713	345,425	369,145	394,863
July	310,192	364,738	381,888	408,033
Aug	308,410	371,185	376,289	410,130
Sept	300,011	366,447	366,735	399,136
Oct	311,391	390,902	386,029	415,513
Nov	309,667	386,518	380,179	403,454
Dec	318,866	400,219	394,905	418,487
Total	3,879,147	4,251,377	4,538,710	4,803,777

	1979	1980	1981	1982
Jan	418,285	430,924	444,826	350,548
Feb	379,405	406,396	404,225	310,405
Mar	419,218	434,260	447,655	336,276
Apr	401,786	421,105	431,189	318,619
May	423,377	437,938	441,356	320,897
June	410,444	424,510	419,802	299,914
July	426,424	426,572	425,115	296,986
Aug	430,192	426,054	416,140	287,077
Sept	419,248	418,945	393,012	271,147
Oct	434,767	436,676	395,585	275,277
Nov	423,244	427,394	364,375	264,800*
Dec	434,702	438,929	364,165	273,110*
Total	5,023,092	5,129,703	4,947,925	3,604,856

Source: Aluminum Association *IA Estimate

U.S Production of Slab Zinc Short tons

	1978	1979	1980	1981	1982
Jan	39,201	45,714	30,511	33,445	26,706
Feb	32,982	46,113	30,613	31,457	23,545
Mar	30,392	52,916	34,777	34,450	23,639
Apr	33,482	51,130	32,123	34,051	21,314
May	35,656	49,870	31,922	32,218	23,656
June	34,506	42,953	28,452	30,828	23,713
July	34,456	44,016	20,774	33,018	20,570
Aug	37,591	41,973	26,703	33,534	22,433
Sept	37,345	39,796	28,613	29,424	26,549
Oct	44,163	46,005	30,990	29,778	27,348
Nov	42,429	43,427	29,884	29,276	26,800*
Dec	42,587	42,000*	33,247	25,301	28,000*
Total	444,790	537,427	358,809	376,780	294,573*
Average	37,066	44,786	29,884	31,398	24,548*

Source: ABMS. *Estimate.

U.S Production of Refined Lead
Short tons

	1978	1979	1980	1981	1982
Jan	59,996	52,980	56,879	57,984	50,527
Feb	50,061	52,237	49,324	53,569	45,193
Mar	55,256	60,632	54,058	58,170	43,994
Apr	55,466	52,493	47,493	52,741	36,111
May	49,057	58,065	47,044	35,038	54,323
June	44,825	55,026	47,142	24,378	52,974
July	42,450	52,606	52,037	33,027	44,224
Aug	50,362	49,878	48,173	45,097	46,362
Sept	51,487	45,400	50,158	43,704	49,201
Oct	60,872	52,936	52,156	46,082	50,574
Nov	55,110	54,598	48,438	39,412	40,000*
Dec	54,249	54,252	53,456	44,036	42,000*
Total	629,191	641,113	606,358	533,238	555,213*
Average	52,432	53,426	50,530	44,437	46,268*

Source: ABMS. *Estimate.

Electrolytic Copper
Cents Per Pound

	1971	1972	1973	1974	1975	1976
Jan	51.48	50.35	53.12	68.70	70.50	63.00
Feb	50.37	50.25	56.12	68.70	63.00	63.00
Mar	50.58	52.63	60.12	68.70	63.00	64.50
Apr	52.87	52.63	60.12	68.70	63.00	68.00
May	52.87	52.63	60.12	81.20	63.00	70.00
June	52.87	52.63	60.12	86.10	62.25	70.00
July	52.87	50.63	60.12	86.30	61.50	74.00
Aug	52.87	50.63	60.12	86.70	63.00	74.00
Sept	52.87	50.63	60.12	83.00	63.00	74.00
Oct	52.87	50.63	60.12	78.25	63.00	72.00
Nov	52.19	50.63	60.12	75.80	63.00	70.00
Dec	50.37	50.63	68.00	73.00	63.00	65.00
Average	52.09	51.24	59.86	77.00	63.44	68.95

	1977	1978	1979	1980	1981	1982
Jan	65.20	62.75	75.63	116.95	88.55	79.54
Feb	67.50	62.25	89.36	134.17	86.01	79.41
Mar	70.63	61.62	97.75	105.97	85.74	76.34
Apr	74.00	64.00	90.50	94.57	88.15	76.87
May	72.80	64.33	89.50	92.91	85.99	78.86
June	69.88	65.23	86.39	92.32	85.11	71.67
July	68.75	63.50	85.95	102.38	83.99	71.64
Aug	64.00	66.47	90.24	101.29	88.32	71.82
Sept	60.00	66.83	92.36	98.78	84.90	71.87
Oct	60.00	69.54	97.72	98.91	83.03	71.94
Nov	60.00	71.20	98.49	96.02	81.93	71.04*
Dec	61.29	71.50	106.10	88.13	80.97	72.00*
Average	66.17	65.77	92.12	101.90	85.31	74.42*

*Estimate

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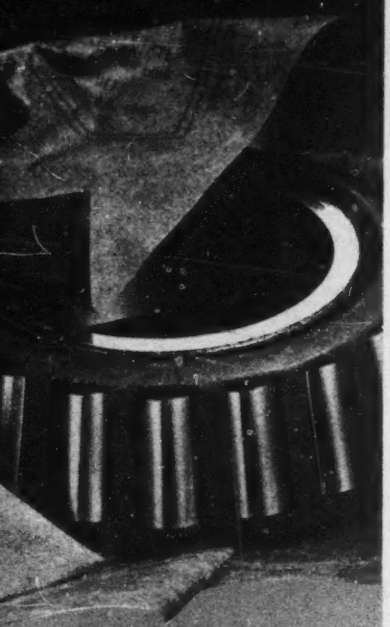

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ANNUAL STATISTICAL REVIEW

Nonferrous Prices and Production

U.S Production of Refined Copper
In tons of 2000 pounds.

	1978	1979	1980	1981	1982
Jan	129,000	135,600	161,000	133,500	117,500
Feb	112,500	135,800	149,500	116,300	123,400
Mar	143,200	152,200	162,300	152,200	121,500
Apr	141,000	149,800	170,400	155,800	116,400
May	145,300	154,600	158,700	135,000	107,500
June	135,100	149,400	167,200	158,300	106,600
July	96,100	132,300	52,400	131,700	81,800
Aug	138,900	144,900	26,700	124,000	77,600
Sept	144,900	137,500	27,300	140,500	80,600
Oct	163,400	148,700	61,000	127,300	83,300
Nov	162,400	145,000	85,800	124,900	80,000*
Dec	133,300	33,514	136,900	147,900	85,000*
Total	1,567,100	1,765,300	1,361,200	1,647,400	1,183,200*
Aver	125,592	147,192	113,433	137,283	98,600*

Source: ABMS. *Estimate.

Lead, Common Grade Price
Cents Per Pound

	1976	1977	1978	1979	1980	1981	1982
Jan	19.00	26.50	33.00	40.58	51.29	34.13	29.95
Feb	19.00	26.67	33.00	43.75	50.00	30.68	28.00
Mar	20.00	30.50	33.00	46.00	49.55	35.28	26.00
Apr	21.88	31.00	33.00	48.00	45.45	37.63	26.50
May	22.88	31.00	31.23	49.76	36.00	37.00	26.50
June	23.00	31.00	31.00	57.62	34.25	38.25	25.80
July	24.17	31.00	31.00	58.60	35.77	41.25	27.90
Aug	24.75	31.00	32.40	57.97	40.97	44.63	27.90
Sept	24.75	31.00	34.30	58.60	42.40	42.50	26.75
Oct	25.50	31.00	37.00	60.74	45.00	37.63	26.00
Nov	25.50	32.00	38.00	58.27	44.00	34.46	23.70*
Dec	25.50	33.00	38.00	57.02	39.00	31.86	24.00*
Average	22.99	30.64	33.74	53.08	42.81	37.11	26.79*

*Estimate

Aluminum 99.5 Pct Ingot
Cents Per Pound, Freight Allowed

	1971	1972	1973	1974	1975	1976
Jan	29.00	29.00	25.00	29.00	39.00	41.00
Feb	29.00	29.00	25.00	29.00	39.00	41.00
Mar	29.00	29.00	25.00	29.24	39.00	41.00
Apr	29.00	29.00	25.00	31.50	39.00	41.75
May	29.00	27.00	25.00	31.50	39.00	44.00
June	29.00	25.00	25.00	33.40	39.00	44.00
July	29.00	25.00	25.00	33.50	39.00	44.00
Aug	29.00	25.00	25.00	35.94	41.00	47.00
Sept	29.00	25.00	25.00	38.70	41.00	48.00
Oct	29.00	25.00	25.00	39.00	41.00	48.00
Nov	29.00	25.00	25.00	39.00	41.00	48.00
Dec	29.00	25.00	27.00	39.00	41.00	48.00
Average	29.00	26.50	25.17	34.00	39.83	44.65

	1977	1978	1979	1980	1981	1982†
Jan	48.00	53.00	55.25	66.25	76.00	76.00
Feb	48.00	53.00	58.00	66.25	76.00	76.00
Mar	48.00	53.00	58.00	66.25	76.00	76.00
Apr	51.00	53.00	59.50	72.00	76.00	76.00
May	51.00	55.25	59.50	72.00	78.00	76.00
June	51.00	55.25	59.50	72.00	78.00	76.00
July	53.00	55.25	62.75	72.00	78.00	76.00
Aug	53.00	55.25	62.75	72.00	78.00	76.00
Sept	53.00	55.25	62.75	72.00	78.00	76.00
Oct	53.00	55.25	66.25	76.00	78.00	76.00
Nov	53.00	55.25	66.25	76.00	78.00	76.00
Dec	53.00	55.25	66.25	76.00	78.00	76.00
Average	51.25	54.50	61.40	71.56	77.33	76.00†

†Nominal

Zinc Prices
1971-81 Prime Western
1982—High Grade†
Cents Per Pound

	1971	1972	1973	1974	1975	1976
Jan	15.00	17.00	19.50	31.18	39.00	37.68
Feb	15.00	17.00	19.50	31.75	39.00	37.00
Mar	15.06	17.50	19.63	32.70	38.75	37.00
Apr	15.50	17.50	20.38	34.75	38.75	37.00
May	15.77	18.00	20.38	34.75	38.75	37.00
June	16.00	18.50	20.38	35.25	38.75	37.00
July	16.19	18.50	20.38	36.97	38.75	37.00
Aug	17.00	18.50	20.38	38.00	38.75	37.00
Sept	17.00	18.50	20.38	38.95	38.75	37.00
Oct	17.00	18.50	20.38	39.00	38.75	37.00
Nov	17.00	19.50	20.38	39.00	38.75	37.00
Dec	17.00	20.00	30.00	39.00	38.75	37.00
Average	16.13	18.25	20.97	35.94	38.79	37.06

	1977	1978	1979	1980	1981	1982†
Jan	37.00	30.50	35.00	37.50	41.25	42.60
Feb	37.00	30.07	36.89	38.67	41.63	43.00
Mar	37.00	29.00	38.05	38.92	43.63	43.00
Apr	37.00	29.00	38.50	38.50	43.75	35.75
May	36.40	29.00	38.50	37.50	46.50	36.00
June	34.00	29.90	38.57	36.50	46.63	35.80
July	34.00	30.00	39.64	35.50	48.63	38.50
Aug	34.00	31.88	36.81	35.97	49.75	39.50
Sept	34.00	32.75	36.07	36.60	49.75	41.00
Oct	32.80	33.75	37.50	37.50	46.50	41.00
Nov	31.17	34.75	37.08	38.60	46.75	40.25*
Dec	30.50	34.75	37.50	40.50	43.75	40.00*
Average	34.57	31.28	37.51	37.70	45.54	39.70*

*Estimate.

Straits Tin, Spot Price
(cents per pound†)

	1977	1978	1979	1980	1981	1982
Jan	425.14	544.94	624.18	758.95	643.35	696.66
Feb	469.01	549.89	660.84	785.67	617.29	660.43
Mar	480.47	514.96	684.35	812.18	607.75	589.40
Apr	445.42	497.24	678.60	785.72	597.65	570.95
May	451.87	526.96	683.46	784.62	568.09	583.13
June	446.53	555.12	697.82	756.62	569.28	566.40
July	460.35	559.52	699.59	752.11	591.87	561.69
Aug	519.77	592.37	678.57	751.51	652.76	564.06
Sept	517.76	627.15	697.18	778.59	675.15	572.26
Oct	573.83	681.05	714.24	744.38	698.17	556.11
Nov	579.95	691.11	724.99	697.21	709.45	534.37
Dec	567.81	636.69	752.17	655.05	708.72	536.00*
Average	496.49	581.40	691.33	N.A.	636.63	582.52*

† U.S. cents per lb, EX-SMELTER, based on daily market in Penang in Malaysian dollars per kilo, beginning June, 1980. Prior prices are C.I.F., New York, based on Penang picul price.

N.A.—Not Applicable *Estimate

Electrolytic Nickel
Cents Per Pound, New York, Duty Paid

Oct. 1, 1976 to July 25, 1977	241.00
Published price suspended through Feb. 1, 1979	
Feb. 2, 1979 to Mar. 13, 1979	210.00
Mar. 14, 1979 to April 10, 1979	230.00
April 11, 1979 to May 13, 1979	255.00
May 14, 1979 to June 6, 1979	290.00
June 7, 1979 to Dec. 4, 1979	305.00
Dec. 5, 1979 to Feb. 27, 1980	325.00
Feb. 28, 1980 to Nov. 24, 1981	350.00
Nov. 25, 1981 to	329.00

Source: Inco, Inc.

MATERIALS NEWSFRONT

Price & Production Data

Important Notice About Iron Age Scrap Prices

Beginning with the Jan. 21 issue Iron Age will publish only one set of scrap prices per issue—those with the effective date as close to the issue date as printing schedules permit. Prices for other weeks will continue to be available on a weekly basis through our Metal Price Phone Hotline or through our Weekly Price Newsletter. (For details on these services see ad on p. 80.)

Lake Superior Ore Prices

51.50% Fe Natural delivered lower Lake ports. Rail transportation, handling and unloading may be charged to the account of the buyer. Coarse ore 80¢ premium.

Pellets (per iron unit natural)..... gross-ton 80.50-86.9*
Old range, non-bessemer ..... gross-ton $32.78
Mesabi, regular-unscreened ..... gross-ton $32.53
Mesabi, non-bessemer.....gross-ton $32.25-32.53**

*80.50¢—Pickands Mather as of 1/27/81.
**86.9¢—U. S. Steel as of 3/15/82. Cleveland-Cliffs as of 2/26/82, Oglebay Norton as of 3/25/82, and Hanna Mining as of 2/26/82.

Steel Production, Composite Prices

(Effective December 20, 1982)

U.S. Steel Production	Last Week	Two Weeks Ago	To Date 1982	To Date 1981
Net tons, in thousands	1,057	1,027	70,679	116,301
Capability Utilization Rate	35.8	34.7	47.6	78.1

Composite Prices	This Week	Week Ago	Month Ago	Year Ago
Finished Steel Base* (¢/lb.—eff. 4/4/82)	25.297	25.297	25.297	25.195
Pig Iron* * (Net ton= 2000 lbs.)	$213.00	$213.00	$213.00	$213.00
Scrap No. 1 hvy.* * * (Gross ton=2240 lbs.)	$ 52.17	$ 51.17	$ 51.17	$ 75.50
No. 2 bundles	$ 38.50	$ 38.50	$ 38.50	$ 52.50
Scrap Comparison (Gross Ton)				
No. 1 steel, Pittsburgh .	$ 52.50	$ 52.50	$ 52.50	$ 85.50
No. 1 steel, Philadelphia	54.50	54.50	54.50	66.50
No. 1 steel, Chicago.....	49.50	46.50	46.50	74.50
No. 1 bundles, Detroit..	41.50	41.50	41.50	74.50
Low Phos., Youngstown	51.50	51.50	52.50	85.50
No. 1 mach'y cast., Pgh	61.50	61.50	61.50	93.50
No. 1 mach'y cast., Phila	98.50	98.50	98.50	111.50
No. 1 mach'y cast., Chi	104.50	103.50	103.50	117.50

*Finished Steel Composite
Weighted index of steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.
**Pig Iron Composite
Based on average prices for basic and foundry pig iron at representative producing points within the U.S.
***Steel Scrap Composite
Average of No. 1 hvy. melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

Nonferrous Prices

(Effective December 20, 1982)
Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated.

Primary Metal Prices

(cents per lb.)	current price	last price	date of change
Aluminum	76.00	76.00-80.00	1/4/82
Copper (C)	70.00-71.00	70.00-71.50	12/14/82
Lead	19.50-23.00	20.50-23.00	12/10/82
Magnesium Ingot	134.00	125.00	6/1/81
Nickel	329.00	350.00	11/25/81
Titanium Sponge	555.00-585.00	555.00	4/29/82
Zinc	36.00-40.00	38.00-40.00	12/8/82

ALUMINUM: 99.5%. COPPER (C) = cathode. LEAD: common grade. MAGNESIUM: 99.8% pig. Velasco, Tex. NICKEL: electro., Port Colborne, Canada. ZINC: high grade.

Antimony, American Laredo, Texas . $2.00
Beryllium-aluminum 5% Be, per lb. contained Be $201.00
Beryllium-copper, per lb. cont. Be $121.00
Beryllium 97% powder 200 ..... $166.00
Bismuth, ton lots ..... $1.25-$1.40
Cadmium, under one ton ..... $1.05-$1.15
Calcium, ton lots, crown $3.05
Chromium, 99.8% $3.75
Cobalt, 99%, cathode $12.50
Gold per troy oz. $440.25
Indium, dollars per troy oz..... $2.60-$2.85
Iridium, dollars per troy oz..... $600
Magnesium sticks, 10,000 lbs. $1.91
Mercury, per 76-lb. f.o.b. N.Y. . . $365-$385
Molybdenum, lb. tech. moly oxides, 20 lb. MO can $5.85
Nickel oxide sinter at U.S. points of entry $3.12
Palladium, per troy oz. $140
Platinum, per troy oz. $475
Rhodium, per troy oz. $600.00
Silver ingots, per troy oz..... $10.54
Vanadium $4.94
Zirconium sponge..... $12.00-$17.00
(Per lb. unless otherwise noted)

Straits Tin Price

(U.S. cents per lb, EX-SMELTER, based on daily market in Penang in Malaysian dollars per kilo.)

Dec. 13—558.91 Dec. 16—561.95
Dec. 14—559.70 Dec. 17—561.95
Dec. 15—559.57

Scrap Prices

Brass Mill Scrap

(Cents per lb; over 20,000 lbs. add 1¢ per lb)

	Solids	Turning
Copper	67⅛	57¼
Yellow brass	58	52⅞
Red brass	61¾	54⅞
Comm. bronze	63	56
Mang. bronze	57½	55¾
Free cutting rod ends	44	43

Custom Smelters Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	56
No. 2 copper wire	50
Light copper	40

Ingot Makers Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	52
No. 2 copper wire	46
Light copper	37
No. 1 composition	50
No. 1 comp. turnings	47
Hvy. yellow brass solids	33
Hvy. yellow brass turnings	26
Radiators	41

Aluminum

New mixed clips	24	—25
Old sheet	23	—24
Old cast	23	—24
Clean dry borings	23	—24

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Aluminum

Segregated clippings	22	—23
Mixed L.C. clips	20	—21
Old sheets and cast	14	—15
Borings and turnings	10	—11
Duraluminum clippings	20	—21

Copper and Brass

No. 1 copper wire	46	—47
No. 2 copper wire	39	—40
Light copper	34	—35
Radiators	32	—33
No. 1 composition	41	—42
No. 1 composition turn'gs	39	—40
Cocks and faucets	28	—29
Clean heavy yellow brass	26	—27
Brass Pipe	28	—29
New soft brass clippings	34	—35

Lead

Heavy soft lead	9	—10
Whole batteries	4	— 5
Type metal	14	—15
Electrotype	18	—19

Nickel

Nickel solids	85	— 90
Nickel rod ends	85	— 90
Nickel sheets, clips	85	— 90
Nickel turnings	40	— 45

Zinc

New zinc clippings	14	—15
Old diecast zinc	7	— 8

EFFECTIVE DECEMBER 20, 1982

MATERIALS NEWSFRONT

(Effective December 20, 1982) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated. Prices are the opinions of *Iron Age* editors and correspondents, based on contacts with dealers, brokers, generators and users in the industry on the effective date listed above.

Ferrous Scrap Prices

Pittsburgh

No. 1 hvy. melting	$ 52.00 to $ 53.00
No. 2 hvy. melting	45.00 to 46.00
No. 1 dealer bundles	65.00 to 66.00
No. 1 factory bundles (auto)	61.00 to 62.00
No. 2 bundles	37.00 to 38.00
No. 1 busheling	58.00 to 59.00
Machine shop turn.	6.00 to 7.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	18.00 to 19.00
Low phos. punchings plate	67.00 to 68.00
Heavy turnings	45.00 to 46.00
No. 1 RR hvy. melting	64.00 to 65.00
Rails 2 ft. and under	76.00 to 77.00
Scrap rails, random lgth.	73.00 to 74.00
RR specialties	65.00 to 66.00
No. 1 machinery cast	61.00 to 62.00
Cupola cast	54.00 to 55.00
Heavy breakable cast	30.00 to 31.00
Stainless	
18-8 bundles and solids	410.00 to 420.00
18-8 turnings	310.00 to 320.00

Chicago

No. 1 hvy. melting	$ 49.00 to $ 50.00
No. 2 hvy. melting	44.00 to 45.00
No. 1 dealer bundles	60.00 to 61.00
No. 1 factory bundles (auto)	65.00 to 66.00
No. 2 dealer bundles	38.00 to 39.00
No. 1 busheling	59.00 to 60.00
Shredder scrap	58.00 to 59.00
Machine shop turn.	14.00 to 15.00
Mixed bor. and turn.	15.00 to 16.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	33.00 to 34.00
Low phos. forge crop	76.00 to 77.00
Low phos. punchings plate ⅛ in. and heavier	80.00 to 81.00
Low phos. 2 ft. and under	76.00 to 77.00
No. 1 RR hvy. melting	50.00 to 51.00
Scrap rails, random lgth.	49.00 to 50.00
Reroller rails	87.00 to 88.00
Rails, 2 ft. and under	76.00 to 77.00
RR couplers and knuckles	70.00 to 71.00
RR car axles	99.00 to 100.00
No. 1 machinery cast	104.00 to 105.00
Cupola cast	90.00 to 91.00
Stove plate	78.00 to 79.00
Steel car wheels	57.00 to 58.00
Stainless	
18-8 bundles and solids	380.00 to 390.00
18-8 turnings	280.00 to 290.00
430 bundles and solids	90.00 to 95.00
430 turnings	65.00 to 70.00

Philadelphia

No. 1 hvy. melting	$ 53.00 to $ 56.00
No. 2 hvy. melting	48.00 to 51.00
No. 1 dealer bundles	67.00 to 70.00
No. 2 dealer bundles	38.00 to 41.00
No. 1 busheling	67.00 to 70.00
Shredder scrap	65.00 to 68.00
Machine shop turn.	18.00 to 21.00
Mixed bor. and turn.	18.00 to 21.00
Shoveling turnings	31.00 to 34.00
Clean cast chemical borings	40.00 to 43.00
Low phos. 5 ft. and under	64.00 to 67.00
Low phos. 2 ft. punchings	85.00 to 88.00
Electric furnace bundles	75.00 to 78.00
RR specialties	74.00 to 77.00
Rails, 2 ft. and under	89.00 to 92.00
Cupola cast	56.00 to 59.00
Heavy breakable cast	53.00 to 56.00
No. 1 machinery cast	97.00 to 100.00

Detroit

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 36.00 to $ 37.00
No. 2 hvy. melting	34.00 to 35.00
No. 1 dealer bundles	41.00 to 42.00
No. 2 bundles	18.00 to 19.00
No. 1 busheling	40.00 to 41.00
Drop forge flashings	21.00 to 22.00
Machine shop turn.	14.00 to 15.00
Mixed borings and turn.	7.00 to 8.00
Shoveling turnings	14.00 to 15.00
Cast iron borings	5.00 to 6.00
Heavy breakable cast	24.00 to 25.00
Mixed cupola cast	40.00 to 41.00
Automobile cast	58.00 to 59.00
Stainless	
18-8 bundles and solids	395.00 to 405.00
18-8 turnings	285.00 to 295.00
430 bundles and solids	70.00 to 80.00

Youngstown

No. 1 hvy. melting	$ 44.00 to $ 45.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 dealer bundles	50.00 to 51.00
No. 2 dealer bundles	29.00 to 30.00
Machine shop turn.	2.00 to 3.00
Shoveling turnings	7.00 to 8.00
Low phos. plate	51.00 to 52.00
Electric furnace bundles	51.00 to 52.00
Galvanized bundles	41.00 to 42.00

Cleveland

No. 1 hvy. melting	$ 42.00 to $ 43.00
No. 2 hvy. melting	24.00 to 25.00
No. 1 dealer bundles	46.00 to 47.00
No. 1 factory bundles	51.00 to 52.00
No. 2 bundles	22.00 to 23.00
No. 1 busheling	47.00 to 48.00
Machine shop turn.	2.00 to 3.00
Mixed bor. and turn.	2.00 to 3.00
Shoveling turnings	5.00 to 6.00
Cast iron borings	5.00 to 6.00
Cut structural & plates, 2 ft. and under	68.00 to 69.00
Low phos. punchings plate	68.00 to 69.00
Drop forge flashings	33.00 to 34.00
Foundry steel, 2 ft. & under	59.00 to 60.00
No. 1 RR hvy melting	63.00 to 64.00
Rails, 2 ft. and under	82.00 to 83.00
Rails, 18 in. and under	83.00 to 84.00
Steel axle turnings	69.00 to 70.00
Railroad cast	82.00 to 83.00
No. 1 machinery cast	79.00 to 80.00
Cupola cast	62.00 to 63.00
Stove plate	47.00 to 48.00
Stainless	
18-8 bundles	300.00 to 310.00
18-8 turnings	250.00 to 260.00
430 bundles	75.00 to 85.00

Buffalo

No. 1 hvy. melting	$ 25.00 to $ 26.00
No. 2 hvy. melting	15.00 to 16.00
No. 1 busheling	30.00 to 31.00
No. 1 dealer bundles	28.00 to 29.00
No. 2 bundles	12.00 to 13.00
Machine shop turn.	1.00 to 2.00
Mixed bor. and turn.	8.00 to 9.00
Shoveling turnings	10.00 to 11.00
Cast iron borings	8.00 to 9.00
Low phos. plate	48.00 to 49.00
Structural and plate, 2 ft. and under	46.00 to 47.00
Rails, 2 ft. and under	42.00 to 43.00
Scrap rails, random lgth.	22.00 to 23.00
No. 1 machinery cast	63.00 to 64.00
No. 1 cupola cast	42.00 to 43.00

St. Louis

No. 1 hvy. melting	$ 47.00 to $ 48.00
No. 2 hvy. melting	39.00 to 40.00
Foundry steel, 2 ft.	39.00 to 40.00
No. 1 dealer bundles	47.00 to 48.00
No. 2 bundles	36.00 to 37.00
Machine shop turn.	12.00 to 13.00
Shoveling turnings	18.00 to 19.00
Cast iron borings	30.00 to 31.00
No. 1 RR hvy. melting	47.00 to 48.00
Rails, random length	49.00 to 50.00
Rails, 18 in. and under	64.00 to 65.00
RR specialties	80.00 to 81.00
Cupola cast	70.00 to 71.00
Heavy breakable cast	48.00 to 49.00
Stove plate	70.00 to 71.00
Cast iron car wheels	49.00 to 50.00
Rerolling rails	84.00 to 85.00
Unstripped motor blocks	55.00 to 56.00

Birmingham

No. 1 heavy melting	$ 54.00 to $ 55.00
No. 2 heavy melting	52.00 to 53.00
No. 1 dealer bundles	54.00 to 55.00
No. 2 bundles	40.00 to 41.00
No. 1 busheling	54.00 to 55.00
Shredder scrap	71.00 to 72.00
Machine shop. turn.	18.00 to 19.00
Shoveling turnings	25.00 to 26.00
Cast iron borings	26.00 to 27.00
Electric furnace bundles	53.00 to 54.00
Elec. furnace, 3 ft. & under	50.00 to 51.00
Structural and plate, 2 ft.	70.00 to 71.00
Structural and plate, 4 ft.	65.00 to 66.00
No. 1 RR hvy. melting	54.00 to 55.00
Scrap rails, random lgth.	52.00 to 53.00
Rails, 18 in. and under	74.00 to 75.00
Angles and splice bars	65.00 to 66.00
No. 1 cupola cast	74.00 to 75.00
Unstripped motor blocks	52.00 to 53.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 27.00 to $ 28.00
No. 2 hvy. melting	26.00 to 27.00
No. 1 dealer bundles	28.00 to 29.00
No. 2 bundles	14.00 to 15.00
Machine shop turn.	1.00 to 2.00
Shoveling turnings	3.00 to 4.00
Cast iron borings	4.00 to 5.00
Low phos. 18 in. and under	52.00 to 53.00
Rails, random length	34.00 to 35.00
Rails, 2 ft. and under	59.00 to 60.00
No. 1 cupola cast	44.00 to 45.00
Heavy breakable cast	20.00 to 21.00
Drop broken cast	59.00 to 60.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 26.00 to $ 27.00
No. 2 hvy. melting	22.00 to 24.00
No. 2 dealer bundles	22.00 to 23.00
Mixed bor. and turn.	7.00 to 8.00
Machine shop turn.	4.00 to 5.00
Shoveling turnings	10.00 to 12.00
Clean cast. chem. borings	34.00 to 35.00
No. 1 machinery cast	89.00 to 90.00
Mixed yard cast	38.00 to 39.00
Heavy breakable cast	14.00 to 15.00
Stainless	
18-8 prepared solids	360.00 to 385.00
18-8 turnings	255.00 to 275.00
430 prepared solids	70.00 to 80.00
410 solids	60.00 to 70.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 28.00 to $ 30.00
No. 2 hvy. melting	20.00 to 22.00
No. 1 dealer bundles	28.00 to 30.00
No. 2 bundles	16.00 to 18.00
No. 1 busheling	28.00 to 30.00
Shredder scrap	38.00 to 40.00
Machine shop turn.	1.00 to 2.00
Shoveling turnings	1.00 to 2.00
No. 1 machinery cast	100.00 to 105.00
Mixed cupola cast	23.00 to 25.00
Heavy breakable cast	4.00 to 6.00

San Francisco

No. 1 hvy. melting	$ 39.00 to $ 41.00
No. 2 hvy. melting	31.00 to 33.00
No. 1 dealer bundles	26.00 to 28.00
No. 2 dealer bundles	11.00 to 13.00
Machine shop turn.	4.00 to 6.00
Cast iron borings	4.00 to 6.00
No. 1 cupola cast	83.00 to 85.00

Los Angeles

No. 1 hvy. melting	$ 38.00 to $ 40.00
No. 2 hvy. melting	27.00 to 29.00
No. 1 dealer bundles	25.00 to 27.00
No. 2 dealer bundles	8.00 to 10.00
Machine shop turn.	4.00 to 6.00
Shoveling turnings	8.00 to 10.00
Cast iron borings	4.00 to 6.00
Elec. furnace, 1 ft. and under (foundry)	84.00 to 86.00
No. 1 cupola cast	86.00 to 88.00

Seattle

No. 1 hvy. melting	$ 53.00 to $ 55.00
No. 2 hvy. melting	42.00 to 44.00
No. 2 bundles	32.00 to 34.00
No. 1 cupola cast	88.00 to 90.00
Mixed yard cast	78.00 to 80.00

Hamilton, Ont.

Brokers buying price per net ton on cars:

No. 1 heavy melting	$ 33.00
No. 2 heavy melting cut 2 ft. and under	30.00
No. 1 dealer bundles	40.00
No. 2 bundles	5.00
Mixed steel scrap	17.00
Bush. new fact. prep'd.	38.00
Bush. new fact. unprp'd.	30.00
Machine shop turn.	18.00
Short steel turn.	21.00
Mixed bor. and turn.	10.00
Cast scrap	30.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 50.00 to $ 51.00
No. 2 hvy. melting	38.00 to 39.00
No. 2 bundles	28.00 to 30.00
Machine shop turn.	8.00 to 9.00
Crushed turnings	17.00 to 19.00
Shredder scrap	50.00 to 51.00
Cut structural plate 2 ft. and under	72.00 to 74.00
Unstripped motor blocks	55.00 to 57.00
Cupola cast	64.00 to 66.00

MATERIALS NEWSFRONT

Price & Production Data

Steel production by districts, thousands of tons (000 omitted)

	Last Week	Two Weeks Ago	Month Ago	Year Ago
North East Coast	151	138	149	205
Buffalo	30	30	29	59
Pittsburgh	121	80	139	213
Youngstown	57	50	53	97
Cleveland	62	61	64	107
Detroit	102	114	105	145
Chicago	283	268	297	465
Cincinnati	52	54	57	79
St. Louis	55	32	56	77
Southern	68	62	59	205
Western	46	45	47	103
U.S. Production	1,027	934	1,055	1,755

Source: American Iron & Steel Institute

Lake Superior Ore Prices

51.50% Fe Natural delivered lower Lake ports. Rail transportation, handling and unloading may be charged to the account of the buyer. Coarse ore 80¢ premium.

Pellets (per iron unit natural)..... gross-ton 80.50-86.9*
Old range, non-bessemer ..... gross-ton $32.78
Mesabi, regular-unscreened ..... gross-ton $32.53
Mesabi, non-bessemer.....gross-ton $32.25-32.53**

*80.50¢—Pickands Mather as of 1/27/81.
**86.9¢—U. S. Steel as of 3/15/82. Cleveland-Cliffs as of 2/26/82, Oglebay Norton as of 3/25/82, and Hanna Mining as of 2/26/82.

Steel Production, Composite Prices

(Effective December 13, 1982)

U.S. Steel Production	Last Week	Two Weeks Ago	To Date 1982	To Date 1981
Net tons, in thousands	1,027	934	69,622	114,531
Capability Utilization Rate	34.7	31.6	47.8	78.5

Composite Prices	This Week	Week Ago	Month Ago	Year Ago
Finished Steel Base* (¢/lb.—eff. 4/4/82)	25.297	25.297	25.297	25.195
Pig Iron* * (Net ton=2000 lbs.)	$213.00	$213.00	$213.00	$213.00
Scrap No. 1 hvy.* * * (Gross ton=2240 lbs.)	$ 51.17	$ 51.17	$ 51.17	$ 75.50
No. 2 bundles	$ 38.50	$ 38.50	$ 38.50	$ 52.83

Scrap Comparison (Gross Ton)				
No. 1 steel, Pittsburgh ..	$ 52.50	$ 52.50	$ 52.50	$84.50
No. 1 steel, Philadelphia	54.50	54.50	54.50	66.50
No. 1 steel, Chicago.....	46.50	46.50	46.50	75.50
No. 1 bundles, Detroit...	41.50	41.50	41.50	73.50
Low Phos., Youngstown	51.50	51.50	52.50	85.50
No. 1 mach'y cast., Pgh	61.50	61.50	64.50	93.50
No. 1 mach'y cast., Phila	98.50	98.50	98.50	111.50
No. 1 mach'y cast., Chi.	103.50	103.50	103.50	117.50

*Finished Steel Composite
Weighted index of steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.
* *Pig Iron Composite
Based on average prices for basic and foundry pig iron at representative producing points within the U.S.
* * *Steel Scrap Composite
Average of No. 1 hvy. melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

Nonferrous Prices

(Effective December 13, 1982)
Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated.

Primary Metal Prices

(cents per lb.)	current price	last price	date of change
Aluminum	76.00	76.00-80.00	1/4/82
Copper (C)	70.00-73.00	71.00-73.00	12/10/82
Lead	19.50-23.00	20.50-23.00	12/10/82
Magnesium Ingot	134.00	125.00	6/1/81
Nickel	329.00	350.00	11/25/81
Titanium Sponge	555.00-585.00	555.00	4/29/82
Zinc	38.00-40.00	38.00-42.00	11/29/82

ALUMINUM: 99.5%. COPPER (C) = cathode. LEAD: common grade. MAGNESIUM: 99.8% pig, Velasco, Tex. NICKEL: electro., Port Colborne, Canada. ZINC: high grade.

Antimony, American Laredo, Texas .$2.00
Beryllium-aluminum 5% Be, per lb. contained Be.....$201.00
Beryllium-copper, per lb. cont. Be $121.00
Beryllium 97% powder 200.....$166.00
Bismuth, ton lots .....$1.25-$1.40
Cadmium, under one ton .....$1.05-$1.15
Calcium, ton lots, crown $3.05
Chromium, 99.8%.....$3.75
Cobalt, 99%, cathode.....$12.50
Gold per troy oz. $438.75
Indium, dollars per troy oz.....$2.60-$2.85
Iridium, dollars per troy oz.....$600
Magnesium sticks, 10,000 lbs. $1.91
Mercury, per 76-lb. f.o.b. N.Y. ..$365-$385
Molybdenum, lb. tech. moly oxides, 20 lb. MO can $5.85
Nickel oxide sinter at U.S. points of entry $3.12
Palladium, per troy oz. $140
Platinum, per troy oz. $475
Rhodium, per troy oz. $600.00
Silver ingots, per troy oz.....$10.38
Vanadium $4.94
Zirconium sponge.....$12.00-$17.00
(Per lb. unless otherwise noted)

Straits Tin Price

(U.S. cents per lb, EX-SMELTER, based on daily market in Penang in Malaysian dollars per kilo.)

Dec. 6—559.31 Dec. 9—559.97
Dec. 7—559.70 Dec. 10—559.97
Dec. 8—560.10

Scrap Prices

Brass Mill Scrap

(Cents per lb; over 20,000 lbs. add 1¢ per lb)

	Solids	Turning
Copper	65½	56¼
Yellow brass	57⅞	52¾
Red brass	61¼	54¾
Comm. bronze	62¼	55¼
Mang. bronze	57¾	56
Free cutting rod ends	44	43

Custom Smelters Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	57
No. 2 copper wire	51
Light copper	42

Ingot Makers Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	53
No. 2 copper wire	47
Light copper	38
No. 1 composition	50
No. 1 comp. turnings	47
Hvy. yellow brass solids	33
Hvy. yellow brass turnings	26
Radiators	42

Aluminum

New mixed clips	23	—24
Old sheet	22	—23
Old cast	22	—23
Clean dry borings	23	—24

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Aluminum

Segregated clippings	22	—23
Mixed L.C. clips	20	—21
Old sheets and cast	14	—15
Borings and turnings	10	—11
Duraluminum clippings	20	—21

Copper and Brass

No. 1 copper wire	47	—48
No. 2 copper wire	40	—41
Light copper	35	—36
Radiators	33	—34
No. 1 composition	41	—42
No. 1 composition turn'gs	39	—40
Cocks and faucets	28	—29
Clean heavy yellow brass	26	—27
Brass Pipe	28	—29
New soft brass clippings	34	—35

Lead

Heavy soft lead	10	—11
Whole batteries	5	— 6
Type metal	15	—16
Electrotype	18	—19

Nickel

Nickel solids	110	—115
Nickel rod ends	110	—115
Nickel sheets, clips	110	—115
Nickel turnings	50	— 55

Zinc

New zinc clippings	14	—15
Old diecast zinc	7	— 8

EFFECTIVE DECEMBER 13, 1982

MATERIALS NEWSFRONT

(Effective December 13, 1982) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated. Prices are the opinions of *Iron Age* editors and correspondents, based on contacts with dealers, brokers, generators and users in the industry on the effective date listed above.

Ferrous Scrap Prices

Pittsburgh

No. 1 hvy. melting	$ 52.00 to $ 53.00
No. 2 hvy. melting	45.00 to 46.00
No. 1 dealer bundles	65.00 to 66.00
No. 1 factory bundles (auto)	58.00 to 59.00
No. 2 bundles	37.00 to 38.00
No. 1 busheling	58.00 to 59.00
Machine shop turn.	6.00 to 7.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	18.00 to 19.00
Low phos. punchings plate	67.00 to 68.00
Heavy turnings	45.00 to 46.00
No. 1 RR hvy. melting	64.00 to 65.00
Rails 2 ft. and under	76.00 to 77.00
Scrap rails, random lgth.	73.00 to 74.00
RR specialties	65.00 to 66.00
No. 1 machinery cast	61.00 to 62.00
Cupola cast	54.00 to 55.00
Heavy breakable cast	30.00 to 31.00
Stainless	
18-8 bundles and solids	410.00 to 420.00
18-8 turnings	310.00 to 320.00

Chicago

No. 1 hvy. melting	$ 46.00 to $ 47.00
No. 2 hvy. melting	42.00 to 43.00
No. 1 dealer bundles	57.00 to 58.00
No. 1 factory bundles (auto)	60.00 to 61.00
No. 2 dealer bundles	38.00 to 39.00
No. 1 busheling	57.00 to 58.00
Shredder scrap	56.00 to 57.00
Machine shop turn.	14.00 to 15.00
Mixed bor. and turn.	15.00 to 16.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	33.00 to 34.00
Low phos. forge crop	74.00 to 75.00
Low phos. punchings plate ¼ in. and heavier	79.00 to 80.00
Low phos. 2 ft. and under	73.00 to 74.00
No. 1 RR hvy. melting	48.00 to 49.00
Scrap rails, random lgth.	47.00 to 48.00
Reroller rails	85.00 to 86.00
Rails, 2 ft. and under	74.00 to 75.00
RR couplers and knuckles	69.00 to 70.00
RR car axles	99.00 to 100.00
No. 1 machinery cast	103.00 to 104.00
Cupola cast	89.00 to 90.00
Stove plate	76.00 to 77.00
Steel car wheels	57.00 to 58.00
Stainless	
18-8 bundles and solids	390.00 to 400.00
18-8 turnings	290.00 to 300.00
430 bundles and solids	90.00 to 95.00
430 turnings	65.00 to 70.00

Philadelphia

No. 1 hvy. melting	$ 53.00 to $ 56.00
No. 2 hvy. melting	48.00 to 51.00
No. 1 dealer bundles	67.00 to 70.00
No. 2 dealer bundles	38.00 to 41.00
No. 1 busheling	67.00 to 70.00
Shredder scrap	65.00 to 68.00
Machine shop turn.	18.00 to 21.00
Mixed bor. and turn.	18.00 to 21.00
Shoveling turnings	31.00 to 34.00
Clean cast chemical borings	40.00 to 43.00
Low phos. 5 ft. and under	60.00 to 63.00
Low phos. 2 ft. punchings	85.00 to 88.00
Electric furnace bundles	75.00 to 78.00
RR specialties	74.00 to 77.00
Rails, 2 ft. and under	89.00 to 92.00
Cupola cast	55.00 to 58.00
Heavy breakable cast	53.00 to 56.00
No. 1 machinery cast	97.00 to 100.00

Detroit

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 36.00 to $ 37.00
No. 2 hvy. melting	34.00 to 35.00
No. 1 dealer bundles	41.00 to 42.00
No. 2 bundles	18.00 to 19.00
No. 1 busheling	40.00 to 41.00
Drop forge flashings	21.00 to 22.00
Machine shop turn.	14.00 to 15.00
Mixed borings and turn.	7.00 to 8.00
Shoveling turnings	14.00 to 15.00
Cast iron borings	5.00 to 6.00
Heavy breakable cast	24.00 to 25.00
Mixed cupola cast	40.00 to 41.00
Automobile cast	58.00 to 59.00
Stainless	
18-8 bundles and solids	395.00 to 405.00
18-8 turnings	285.00 to 295.00
430 bundles and solids	70.00 to 80.00

Youngstown

No. 1 hvy. melting	$ 44.00 to $ 45.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 dealer bundles	50.00 to 51.00
No. 2 dealer bundles	29.00 to 30.00
Machine shop turn.	2.00 to 3.00
Shoveling turnings	7.00 to 8.00
Low phos. plate	51.00 to 52.00
Electric furnace bundles	51.00 to 52.00
Galvanized bundles	41.00 to 42.00

Cleveland

No. 1 hvy. melting	$ 42.00 to $ 43.00
No. 2 hvy. melting	24.00 to 25.00
No. 1 dealer bundles	46.00 to 47.00
No. 1 factory bundles	51.00 to 52.00
No. 2 bundles	22.00 to 23.00
No. 1 busheling	47.00 to 48.00
Machine shop turn.	2.00 to 3.00
Mixed bor. and turn.	2.00 to 3.00
Shoveling turnings	5.00 to 6.00
Cast iron borings	5.00 to 6.00
Cut structural & plates, 2 ft. and under	68.00 to 69.00
Low phos. punchings plate	68.00 to 69.00
Drop forge flashings	33.00 to 34.00
Foundry steel, 2 ft. & under	59.00 to 60.00
No. 1 RR hvy melting	63.00 to 64.00
Rails, 2 ft. and under	82.00 to 83.00
Rails, 18 in. and under	83.00 to 84.00
Steel axle turnings	69.00 to 70.00
Railroad cast	82.00 to 83.00
No. 1 machinery cast	79.00 to 80.00
Cupola cast	62.00 to 63.00
Stove plate	47.00 to 48.00
Stainless	
18-8 bundles	300.00 to 310.00
18-8 turnings	250.00 to 260.00
430 bundles	75.00 to 85.00

Buffalo

No. 1 hvy. melting	$ 25.00 to $ 26.00
No. 2 hvy. melting	15.00 to 16.00
No. 1 busheling	30.00 to 31.00
No. 1 dealer bundles	28.00 to 29.00
No. 2 bundles	12.00 to 13.00
Machine shop turn.	1.00 to 2.00
Mixed bor. and turn.	8.00 to 9.00
Shoveling turnings	10.00 to 11.00
Cast iron borings	8.00 to 9.00
Low phos. plate	48.00 to 49.00
Structural and plate, 2 ft. and under	46.00 to 47.00
Rails, 2 ft. and under	42.00 to 43.00
Scrap rails, random lgth.	22.00 to 23.00
No. 1 machinery cast	63.00 to 64.00
No. 1 cupola cast	42.00 to 43.00

St. Louis

No. 1 hvy. melting	$ 47.00 to $ 48.00
No. 2 hvy. melting	39.00 to 40.00
Foundry steel, 2 ft.	39.00 to 40.00
No. 1 dealer bundles	47.00 to 48.00
No. 2 bundles	36.00 to 37.00
Machine shop turn.	12.00 to 13.00
Shoveling turnings	18.00 to 19.00
Cast iron borings	30.00 to 31.00
No. 1 RR hvy. melting	47.00 to 48.00
Rails, random length	49.00 to 50.00
Rails, 18 in. and under	64.00 to 65.00
RR specialties	80.00 to 81.00
Cupola cast	70.00 to 71.00
Heavy breakable cast	48.00 to 49.00
Stove plate	70.00 to 71.00
Cast iron car wheels	49.00 to 50.00
Rerolling rails	84.00 to 85.00
Unstripped motor blocks	55.00 to 56.00

Birmingham

No. 1 heavy melting	$ 54.00 to $ 55.00
No. 2 heavy melting	52.00 to 53.00
No. 1 dealer bundles	54.00 to 55.00
No. 2 bundles	40.00 to 41.00
No. 1 busheling	54.00 to 55.00
Shredder scrap	71.00 to 72.00
Machine shop. turn.	18.00 to 19.00
Shoveling turnings	25.00 to 26.00
Cast iron borings	26.00 to 27.00
Electric furnace bundles	51.00 to 52.00
Elec. furnace, 3 ft. & under	50.00 to 51.00
Structural and plate, 2 ft.	70.00 to 71.00
Structural and plate, 4 ft.	65.00 to 66.00
No. 1 RR hvy. melting	54.00 to 55.00
Scrap rails, random lgth.	57.00 to 58.00
Rails, 18 in. and under	74.00 to 75.00
Angles and splice bars	65.00 to 66.00
No. 1 cupola cast	74.00 to 75.00
Unstripped motor blocks	52.00 to 53.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 27.00 to $ 28.00
No. 2 hvy. melting	26.00 to 27.00
No. 1 dealer bundles	28.00 to 29.00
No. 2 bundles	14.00 to 15.00
Machine shop turn.	1.00 to 2.00
Shoveling turnings	3.00 to 4.00
Cast iron borings	4.00 to 5.00
Low phos. 18 in. and under	52.00 to 53.00
Rails, random length	34.00 to 35.00
Rails, 2 ft. and under	59.00 to 60.00
No. 1 cupola cast	44.00 to 45.00
Heavy breakable cast	20.00 to 21.00
Drop broken cast	59.00 to 60.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 26.00 to $ 27.00
No. 2 hvy. melting	22.00 to 24.00
No. 2 dealer bundles	22.00 to 23.00
Mixed bor. and turn.	7.00 to 8.00
Machine shop turn.	4.00 to 5.00
Shoveling turnings	10.00 to 12.00
Clean cast. chem. borings	34.00 to 35.00
No. 1 machinery cast	89.00 to 90.00
Mixed yard cast	38.00 to 39.00
Heavy breakable cast	14.00 to 15.00
Stainless	
18-8 prepared solids	385.00 to 390.00
18-8 turnings	280.00 to 280.00
430 prepared solids	70.00 to 80.00
410 solids	60.00 to 70.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 28.00 to $ 30.00
No. 2 hvy. melting	20.00 to 22.00
No. 1 dealer bundles	28.00 to 30.00
No. 2 bundles	16.00 to 18.00
No. 1 busheling	28.00 to 30.00
Shredder scrap	38.00 to 40.00
Machine shop turn.	1.00 to 2.00
Shoveling turnings	1.00 to 2.00
No. 1 machinery cast	100.00 to 105.00
Mixed cupola cast	23.00 to 25.00
Heavy breakable cast	4.00 to 6.00

San Francisco

No. 1 hvy. melting	$ 39.00 to $ 41.00
No. 2 hvy. melting	31.00 to 33.00
No. 1 dealer bundles	26.00 to 28.00
No. 2 dealer bundles	11.00 to 13.00
Machine shop turn.	4.00 to 6.00
Cast iron borings	4.00 to 6.00
No. 1 cupola cast	83.00 to 85.00

Los Angeles

No. 1 hvy. melting	$ 38.00 to $ 40.00
No. 2 hvy. melting	27.00 to 29.00
No. 1 dealer bundles	25.00 to 27.00
No. 2 dealer bundles	8.00 to 10.00
Machine shop turn.	4.00 to 6.00
Shoveling turnings	8.00 to 10.00
Cast iron borings	4.00 to 6.00
Elec. furnace, 1 ft. and under (foundry)	84.00 to 86.00
No. 1 cupola cast	86.00 to 88.00

Seattle

No. 1 hvy. melting	$ 53.00 to $ 55.00
No. 2 hvy. melting	42.00 to 44.00
No. 2 bundles	32.00 to 34.00
No. 1 cupola cast	88.00 to 90.00
Mixed yard cast	78.00 to 80.00

Hamilton, Ont.

Brokers buying price per net ton on cars:

No. 1 heavy melting	$ 33.00
No. 2 heavy melting cut 2 ft. and under	30.00
No. 1 dealer bundles	40.00
No. 2 bundles	5.00
Mixed steel scrap	17.00
Bush. new fact. prep'd.	38.00
Bush. new fact. unprp'd.	30.00
Machine shop turn.	18.00
Short steel turn.	21.00
Mixed bor. and turn.	10.00
Cast scrap	30.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 50.00 to $ 51.00
No. 2 hvy. melting	38.00 to 39.00
No. 2 bundles	28.00 to 30.00
Machine shop turn.	8.00 to 9.00
Crushed turnings	17.00 to 19.00
Shredder scrap	50.00 to 51.00
Cut structural plate 2 ft. and under	72.00 to 74.00
Unstripped motor blocks	55.00 to 57.00
Cupola cast	84.00 to 86.00

MATERIALS NEWSFRONT

Price & Production Data

Steel production by districts, thousands of tons (000 omitted)

	Last Week	Two Weeks Ago	Month Ago	Year Ago
North East Coast	138	141	160	197
Buffalo	30	30	31	58
Pittsburgh	80	62	137	285
Youngstown	50	43	56	119
Cleveland	61	67	65	103
Detroit	114	89	98	147
Chicago	268	290	322	465
Cincinnati	54	57	64	85
St. Louis	32	33	54	83
Southern	62	60	70	200
Western	45	43	49	111
U.S. Production	934	915	1,106	1,852

Source: American Iron & Steel Institute

Lake Superior Ore Prices

51.50% Fe Natural delivered lower Lake ports. Rail transportation, handling and unloading may be charged to the account of the buyer. Coarse ore 80¢ premium.

Pellets (per iron unit natural)..... gross-ton 80.50-86.9*
Old range, non-bessemer ..... gross-ton $32.78
Mesabi, regular-unscreened ..... gross-ton $32.53
Mesabi, non-bessemer..... gross-ton $32.25-32.53**

*80.50¢—Pickands Mather as of 1/27/81.
**86.9¢—U. S. Steel as of 3/15/82. Cleveland-Cliffs as of 2/26/82, Oglebay Norton as of 3/25/82, and Hanna Mining as of 2/26/82.

Steel Production, Composite Prices

(Effective December 6, 1982)

U.S. Steel Production	Last Week	Two Weeks Ago	To Date 1982	To Date 1981
Net tons, in thousands	934	915	68,595	112,702
Capability Utilization Rate	31.6	31.0	48.1	78.9

Composite Prices	This Week	Week Ago	Month Ago	Year Ago
Finished Steel Base* (¢/lb.—eff. 4/4/82)	25.297	25.297	25.297	25.195
Pig Iron* * (Net ton=2000 lbs.)	$213.00	$213.00	$213.00	$213.00
Scrap No. 1 hvy.* * * (Gross ton=2240 lbs.)	$ 51.17	$ 51.17	$ 51.17	$ 75.50
No. 2 bundles	$ 38.50	$ 38.50	$ 38.83	$ 52.83
Scrap Comparison (Gross Ton)				
No. 1 steel, Pittsburgh ..	$ 52.50	$ 52.50	$ 52.50	$84.50
No. 1 steel, Philadelphia	54.50	54.50	54.50	66.50
No. 1 steel, Chicago.....	46.50	46.50	46.50	75.50
No. 1 bundles, Detroit...	41.50	41.50	41.50	73.50
Low Phos., Youngstown	51.50	52.50	52.50	85.50
No. 1 mach'y cast., Pgh	61.50	61.50	64.50	93.50
No. 1 mach'y cast., Phila	98.50	98.50	98.50	111.50
No. 1 mach'y cast., Chi.	103.50	103.50	103.50	117.50

*Finished Steel Composite
Weighted index of steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.
* *Pig Iron Composite
Based on average prices for basic and foundry pig iron at representative producing points within the U.S.
* * *Steel Scrap Composite
Average of No. 1 hvy. melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

Nonferrous Prices

(Effective December 6, 1982)
Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated.

Primary Metal Prices

(cents per lb.)	current price	last price	date of change
Aluminum	76.00	76.00-80.00	1/4/82
Copper (C)	71.00	70.00-71.00	12/3/82
Lead	20.50-26.00	21.50-26.00	11/19/82
Magnesium Ingot	134.00	125.00	6/1/81
Nickel	329.00	350.00	11/25/81
Titanium Sponge	555.00-585.00	555.00	4/29/82
Zinc	38.00-40.00	38.00-42.00	11/29/82

ALUMINUM: 99.5%. COPPER (C) = cathode. LEAD: common grade. MAGNESIUM: 99.8% pig, Velasco, Tex. NICKEL: electro., Port Colborne, Canada. ZINC: high grade.

Antimony, American Laredo, Texas .$2.00
Beryllium-aluminum 5% Be, per lb. contained Be $201.00
Beryllium-copper, per lb. cont. Be $121.00
Beryllium 97% powder 200 .....$166.00
Bismuth, ton lots .....$1.25-$1.40
Cadmium, under one ton .....$1.05-$1.15
Calcium, ton lots, crown $3.05
Chromium, 99.8% $3.75
Cobalt, 99%, cathode $12.50
Gold per troy oz. $445.25
Indium, dollars per troy oz. .....$2.60-$2.85
Iridium, dollars per troy oz. $600
Magnesium sticks, 10,000 lbs. $1.91
Mercury, per 76-lb. f.o.b. N.Y. ..$365-$385
Molybdenum, lb. tech. moly oxides, 20 lb. MO can $5.85
Nickel oxide sinter at U.S. points of entry $3.12
Palladium, per troy oz. $140
Platinum, per troy oz. $475
Rhodium, per troy oz. $600.00
Silver ingots, per troy oz. $10.26
Vanadium $4.94
Zirconium sponge .....$12.00-$17.00
(Per lb. unless otherwise noted)

Straits Tin Price

(U.S. cents per lb, EX-SMELTER, based on daily market in Penang in Malaysian dollars per kilo.)

Nov. 29—559.97 Dec. 2—559.97
Nov. 30—559.83 Dec. 3—559.04
Dec. 1—559.97

Scrap Prices

Brass Mill Scrap

(Cents per lb; over 20,000 lbs. add 1¢ per lb)

	Solids	Turning
Copper	65½	58¼
Yellow brass	57⅞	52¾
Red brass	61¼	54¾
Comm. bronze	62¼	55¼
Mang. bronze	57¾	56
Free cutting rod ends	44	43

Custom Smelters Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	57
No. 2 copper wire	51
Light copper	42

Ingot Makers Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	53
No. 2 copper wire	47
Light copper	38
No. 1 composition	50
No. 1 comp. turnings	47
Hvy. yellow brass solids	33
Hvy. yellow brass turnings	26
Radiators	42

Aluminum

New mixed clips	23	—24
Old sheet	22	—23
Old cast	22	—23
Clean dry borings	23	—24

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Aluminum

Segregated clippings	22	—23
Mixed L.C. clips	20	—21
Old sheets and cast	14	—15
Borings and turnings	10	—11
Duraluminum clippings	20	—21

Copper and Brass

No. 1 copper wire	47	—48
No. 2 copper wire	40	—41
Light copper	35	—36
Radiators	33	—34
No. 1 composition	41	—42
No. 1 composition turn'gs	39	—40
Cocks and faucets	28	—29
Clean heavy yellow brass	26	—27
Brass Pipe	28	—29
New soft brass clippings	34	—35

Lead

Heavy soft lead	10	—11
Whole batteries	5	— 6
Type metal	15	—16
Electrotype	18	—19

Nickel

Nickel solids	110	—115
Nickel rod ends	110	—115
Nickel sheets, clips	110	—115
Nickel turnings	50	— 55

Zinc

New zinc clippings	14	—15
Old diecast zinc	7	— 8

EFFECTIVE DECEMBER 6, 1982

MATERIALS NEWSFRONT

(Effective December 6, 1982) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated. Prices are the opinions of *Iron Age* editors and correspondents, based on contacts with dealers, brokers, generators and users in the industry on the effective date listed above.

Ferrous Scrap Prices

Pittsburgh

No. 1 hvy. melting	$ 52.00 to	$ 53.00
No. 2 hvy. melting	45.00 to	46.00
No. 1 dealer bundles	65.00 to	66.00
No. 1 factory bundles (auto)	58.00 to	59.00
No. 2 bundles	37.00 to	38.00
No. 1 busheling	58.00 to	59.00
Machine shop turn.	6.00 to	7.00
Shoveling turnings	20.00 to	21.00
Cast iron borings	18.00 to	19.00
Low phos. punchings plate	67.00 to	68.00
Heavy turnings	45.00 to	46.00
No. 1 RR hvy. melting	64.00 to	65.00
Rails 2 ft. and under	76.00 to	77.00
Scrap rails, random lgth.	73.00 to	74.00
RR specialties	65.00 to	66.00
No. 1 machinery cast	61.00 to	62.00
Cupola cast	54.00 to	55.00
Heavy breakable cast	30.00 to	31.00
Stainless		
18-8 bundles and solids	410.00 to	420.00
18-8 turnings	310.00 to	320.00

Chicago

No. 1 hvy. melting	$ 46.00 to	$ 47.00
No. 2 hvy. melting	42.00 to	43.00
No. 1 dealer bundles	57.00 to	58.00
No. 1 factory bundles (auto)	60.00 to	61.00
No. 2 dealer bundles	38.00 to	39.00
No. 1 busheling	56.00 to	57.00
Shredder scrap	56.00 to	57.00
Machine shop turn.	14.00 to	15.00
Mixed bor. and turn.	15.00 to	16.00
Shoveling turnings	19.00 to	20.00
Cast iron borings	33.00 to	34.00
Low phos. forge crop	74.00 to	75.00
Low phos. punchings plate ¼ in. and heavier	78.00 to	79.00
Low phos. 2 ft. and under	73.00 to	74.00
No. 1 RR hvy. melting	48.00 to	49.00
Scrap rails, random lgth.	47.00 to	48.00
Reroller rails	85.00 to	86.00
Rails, 2 ft. and under	74.00 to	75.00
RR couplers and knuckles	69.00 to	70.00
RR car axles	99.00 to	100.00
No. 1 machinery cast	103.00 to	104.00
Cupola cast	89.00 to	90.00
Stove plate	76.00 to	77.00
Steel car wheels	57.00 to	58.00
Stainless		
18-8 bundles and solids	390.00 to	400.00
18-8 turnings	290.00 to	300.00
430 bundles and solids	90.00 to	95.00
430 turnings	65.00 to	70.00

Philadelphia

No. 1 hvy. melting	$ 53.00 to	$ 56.00
No. 2 hvy. melting	48.00 to	51.00
No. 1 dealer bundles	65.00 to	68.00
No. 2 dealer bundles	38.00 to	41.00
No. 1 busheling	65.00 to	68.00
Shredder scrap	65.00 to	68.00
Machine shop turn.	18.00 to	21.00
Mixed bor. and turn.	18.00 to	21.00
Shoveling turnings	30.00 to	33.00
Clean cast chemical borings	40.00 to	43.00
Low phos. 5 ft. and under	60.00 to	63.00
Low phos. 2 ft. punchings	85.00 to	88.00
Electric furnace bundles	75.00 to	78.00
RR specialties	74.00 to	77.00
Rails, 2 ft. and under	89.00 to	92.00
Cupola cast	55.00 to	58.00
Heavy breakable cast	53.00 to	56.00
No. 1 machinery cast	97.00 to	100.00

Detroit

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 36.00 to	$ 37.00
No. 2 hvy. melting	34.00 to	35.00
No. 1 dealer bundles	41.00 to	42.00
No. 2 bundles	18.00 to	19.00
No. 1 busheling	40.00 to	41.00
Drop forge flashings	21.00 to	22.00
Machine shop turn.	14.00 to	15.00
Mixed borings and turn.	7.00 to	8.00
Shoveling turnings	14.00 to	15.00
Cast iron borings	5.00 to	6.00
Heavy breakable cast	24.00 to	25.00
Mixed cupola cast	40.00 to	41.00
Automobile cast	58.00 to	59.00
Stainless		
18-8 bundles and solids	395.00 to	405.00
18-8 turnings	285.00 to	295.00
430 bundles and solids	70.00 to	80.00

Youngstown

No. 1 hvy. melting	$ 44.00 to	$ 45.00
No. 2 hvy. melting	29.00 to	30.00
No. 1 dealer bundles	50.00 to	51.00
No. 2 dealer bundles	29.00 to	30.00
Machine shop turn.	2.00 to	3.00
Shoveling turnings	7.00 to	8.00
Low phos. plate	51.00 to	52.00
Electric furnace bundles	51.00 to	52.00
Galvanized bundles	41.00 to	42.00

Cleveland

No. 1 hvy. melting	$ 42.00 to	$ 43.00
No. 2 hvy. melting	24.00 to	25.00
No. 1 dealer bundles	46.00 to	47.00
No. 1 factory bundles	51.00 to	52.00
No. 2 bundles	22.00 to	23.00
No. 1 busheling	47.00 to	48.00
Machine shop turn.	2.00 to	3.00
Mixed bor. and turn.	2.00 to	3.00
Shoveling turnings	5.00 to	6.00
Cast iron borings	5.00 to	6.00
Cut structural & plates, 2 ft. and under	68.00 to	69.00
Low phos. punchings plate	68.00 to	69.00
Drop forge flashings	33.00 to	34.00
Foundry steel, 2 ft. & under	59.00 to	60.00
No. 1 RR hvy melting	63.00 to	64.00
Rails, 2 ft. and under	82.00 to	83.00
Rails, 18 in. and under	83.00 to	84.00
Steel axle turnings	69.00 to	70.00
Railroad cast	82.00 to	83.00
No. 1 machinery cast	79.00 to	80.00
Cupola cast	62.00 to	63.00
Stove plate	47.00 to	48.00
Stainless		
18-8 bundles	300.00 to	310.00
18-8 turnings	250.00 to	260.00
430 bundles	75.00 to	85.00

Buffalo

No. 1 hvy. melting	$ 25.00 to	$ 26.00
No. 2 hvy. melting	15.00 to	16.00
No. 1 busheling	30.00 to	31.00
No. 1 dealer bundles	28.00 to	29.00
No. 2 bundles	12.00 to	13.00
Machine shop turn.	1.00 to	2.00
Mixed bor. and turn.	8.00 to	9.00
Shoveling turnings	10.00 to	11.00
Cast iron borings	8.00 to	9.00
Low phos. plate	48.00 to	49.00
Structural and plate, 2 ft. and under	46.00 to	47.00
Rails, 2 ft. and under	42.00 to	43.00
Scrap rails, random lgth.	22.00 to	23.00
No. 1 machinery cast	63.00 to	64.00
No. 1 cupola cast	42.00 to	43.00

St. Louis

No. 1 hvy. melting	$ 47.00 to	$ 48.00
No. 2 hvy. melting	39.00 to	40.00
Foundry steel, 2 ft.	39.00 to	40.00
No. 1 dealer bundles	47.00 to	48.00
No. 2 bundles	36.00 to	37.00
Machine shop turn.	12.00 to	13.00
Shoveling turnings	18.00 to	19.00
Cast iron borings	30.00 to	31.00
No. 1 RR hvy. melting	47.00 to	48.00
Rails, random length	49.00 to	50.00
Rails, 18 in. and under	64.00 to	65.00
RR specialties	80.00 to	81.00
Cupola cast	70.00 to	71.00
Heavy breakable cast	48.00 to	49.00
Stove plate	70.00 to	71.00
Cast iron car wheels	49.00 to	50.00
Rerolling rails	84.00 to	85.00
Unstripped motor blocks	55.00 to	56.00

Birmingham

No. 1 heavy melting	$ 54.00 to	$ 55.00
No. 2 heavy melting	52.00 to	53.00
No. 1 dealer bundles	54.00 to	55.00
No. 2 bundles	43.00 to	44.00
No. 1 busheling	54.00 to	55.00
Shredder scrap	72.00 to	73.00
Machine shop. turn.	18.00 to	19.00
Shoveling turnings	25.00 to	26.00
Cast iron borings	26.00 to	27.00
Electric furnace bundles	51.00 to	52.00
Elec. furnace, 3 ft. & under	52.00 to	53.00
Structural and plate, 2 ft.	70.00 to	71.00
Structural and plate, 4 ft.	65.00 to	66.00
No. 1 RR hvy. melting	54.00 to	55.00
Scrap rails, random lgth.	57.00 to	58.00
Rails, 18 in. and under	74.00 to	75.00
Angles and splice bars	65.00 to	66.00
No. 1 cupola cast	74.00 to	75.00
Unstripped motor blocks	52.00 to	53.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 27.00 to	$ 28.00
No. 2 hvy. melting	26.00 to	27.00
No. 1 dealer bundles	28.00 to	29.00
No. 2 bundles	14.00 to	15.00
Machine shop turn.	1.00 to	2.00
Shoveling turnings	3.00 to	4.00
Cast iron borings	4.00 to	5.00
Low phos. 18 in. and under	52.00 to	53.00
Rails, random length	34.00 to	35.00
Rails, 2 ft. and under	59.00 to	60.00
No. 1 cupola cast	44.00 to	45.00
Heavy breakable cast	20.00 to	21.00
Drop broken cast	59.00 to	60.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 26.00 to	$ 27.00
No. 2 hvy. melting	22.00 to	24.00
No. 2 dealer bundles	22.00 to	23.00
Mixed bor. and turn.	7.00 to	8.00
Machine shop turn.	4.00 to	5.00
Shoveling turnings	10.00 to	12.00
Clean cast. chem. borings	34.00 to	35.00
No. 1 machinery cast	89.00 to	90.00
Mixed yard cast	38.00 to	39.00
Heavy breakable cast	14.00 to	15.00
Stainless		
18-8 prepared solids	375.00 to	400.00
18-8 turnings	290.00 to	325.00
430 prepared solids	80.00 to	90.00
410 solids	70.00 to	80.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 28.00 to	$ 30.00
No. 2 hvy. melting	20.00 to	22.00
No. 1 dealer bundles	28.00 to	30.00
No. 2 bundles	16.00 to	18.00
No. 1 busheling	28.00 to	30.00
Shredder scrap	38.00 to	40.00
Machine shop turn.	1.00 to	2.00
Shoveling turnings	1.00 to	2.00
No. 1 machinery cast	100.00 to	105.00
Mixed cupola cast	23.00 to	25.00
Heavy breakable cast	4.00 to	6.00

San Francisco

No. 1 hvy. melting	$ 39.00 to	$ 41.00
No. 2 hvy. melting	31.00 to	33.00
No. 1 dealer bundles	26.00 to	28.00
No. 2 dealer bundles	11.00 to	13.00
Machine shop turn.	4.00 to	6.00
Cast iron borings	4.00 to	6.00
No. 1 cupola cast	83.00 to	85.00

Los Angeles

No. 1 hvy. melting	$ 38.00 to	$ 40.00
No. 2 hvy. melting	27.00 to	29.00
No. 1 dealer bundles	25.00 to	27.00
No. 2 dealer bundles	8.00 to	10.00
Machine shop turn.	4.00 to	6.00
Shoveling turnings	8.00 to	10.00
Cast iron borings	4.00 to	6.00
Elec. furnace, 1 ft. and under (foundry)	84.00 to	86.00
No. 1 cupola cast	86.00 to	88.00

Seattle

No. 1 hvy. melting	$ 53.00 to	$ 55.00
No. 2 hvy. melting	42.00 to	44.00
No. 2 bundles	32.00 to	34.00
No. 1 cupola cast	88.00 to	90.00
Mixed yard cast	78.00 to	80.00

Hamilton, Ont.

Brokers buying price per net ton on cars:

No. 1 heavy melting	$ 33.00
No. 2 heavy melting cut 2 ft. and under	30.00
No. 1 dealer bundles	40.00
No. 2 bundles	5.00
Mixed steel scrap	17.00
Bush. new fact. prep'd.	38.00
Bush. new fact. unprp'd.	30.00
Machine shop turn.	18.00
Short steel turn.	21.00
Mixed bor. and turn.	10.00
Cast scrap	30.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 50.00 to	$ 51.00
No. 2 hvy. melting	38.00 to	39.00
No. 2 bundles	28.00 to	30.00
Machine shop turn.	8.00 to	9.00
Crushed turnings	17.00 to	19.00
Shredder scrap	50.00 to	51.00
Cut structural plate 2 ft. and under	72.00 to	74.00
Unstripped motor blocks	55.00 to	57.00
Cupola cast	64.00 to	66.00

EFFECTIVE NOVEMBER 29, 1982

MATERIALS NEWSFRONT

Price & Production Data

Steel production by districts, thousands of tons (000 omitted)

	Last Week	Two Weeks Ago	Month Ago	Year Ago
North East Coast	141	149	156	212
Buffalo	30	29	30	60
Pittsburgh	62	139	126	309
Youngstown	43	53	68	138
Cleveland	67	64	81	109
Detroit	89	105	92	119
Chicago	290	297	326	490
Cincinnati	57	57	63	96
St. Louis	33	56	52	85
Southern	60	59	69	208
Western	43	47	48	123
U.S. Production	915	1,055	1,111	1,949

Source: American Iron & Steel Institute

Lake Superior Ore Prices

51.50% Fe Natural delivered lower Lake ports. Rail transportation, handling and unloading may be charged to the account of the buyer. Coarse ore 80¢ premium

Pellets (per iron unit natural)..... gross-ton 80.50-86.9*
Old range, non-bessemer ..... gross-ton $32.78
Mesabi, regular-unscreened ..... gross-ton $32.53
Mesabi, non-bessemer.....gross-ton $32.25-32.53**

*80.50¢—Pickands Mather as of 1/27/81.
**86.9¢—U. S. Steel as of 3/15/82. Cleveland-Cliffs as of 2/26/82, Oglebay Norton as of 3/25/82, and Hanna Mining as of 2/26/82.

Steel Production, Composite Prices

(Effective November 29, 1982)

U.S. Steel Production	Last Week	Two Weeks Ago	To Date 1982	To Date 1981
Net tons, in thousands	915	1,055	67,661	110,891
Capability Utilization Rate	31.0	35.7	48.5	79.2

Composite Prices	This Week	Week Ago	Month Ago	Year Ago
Finished Steel Base* (¢/lb.—eff. 4/4/82)	25.197	25.297	25.297	25.195
Pig Iron* * (Net ton=2000 lbs.)	$213.00	$213.00	$213.00	$203.00
Scrap No. 1 hvy.* * * (Gross ton=2240 lbs.)	$ 51.17	$ 51.17	$ 51.17	$ 75.50
No. 2 bundles	$ 38.50	$ 38.50	$ 38.83	$ 53.83

Scrap Comparison (Gross Ton)				
No. 1 steel, Pittsburgh ..	$ 52.50	$ 52.50	$ 52.50	$84.50
No. 1 steel, Philadelphia	54.50	54.50	54.50	66.50
No. 1 steel, Chicago.....	46.50	46.50	46.50	75.50
No. 1 bundles, Detroit...	41.50	41.50	41.50	73.50
Low Phos., Youngstown	52.50	52.50	52.50	85.50
No. 1 mach'y cast., Pgh	61.50	64.50	64.50	93.50
No. 1 mach'y cast., Phila	98.50	98.50	98.50	111.50
No. 1 mach'y cast., Chi.	103.50	103.50	103.50	117.50

*Finished Steel Composite
Weighted index of steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

* *Pig Iron Composite
Based on average prices for basic and foundry pig iron at representative producing points within the U.S.

* * *Steel Scrap Composite
Average of No. 1 hvy. melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

Nonferrous Prices

(Effective November 29, 1982)
Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated.

Primary Metal Prices

(cents per lb.)	current price	last price	date of change
Aluminum	76.00	76.00-80.00	1/4/82
Copper (C)	68.00	68.00-70.00	11/12/82
Lead	20.50-26.00	21.50-26.00	11/19/82
Magnesium Ingot	134.00	125.00	6/1/81
Nickel	329.00	350.00	11/25/81
Titanium Sponge	555.00-585.00	555.00	4/29/82
Zinc	38.00-42.00	40.00-42.00	11/9/82

ALUMINUM: 99.5%. COPPER (C) = cathode. LEAD: common grade. MAGNESIUM: 99.8% pig. Velasco, Tex. NICKEL: electro., Port Colborne, Canada. ZINC: high grade.

Antimony, American Laredo, Texas . $2.00
Beryllium-aluminum 5% Be, per lb. contained Be $201.00
Beryllium-copper, per lb. cont. Be $121.00
Beryllium 97% powder 200 ..... $166.00
Bismuth, ton lots ..... $1.35-$1.45
Cadmium, under one ton ..... $1.05-$1.15
Calcium, ton lots, crown $3.05
Chromium, 99.8% $3.75
Cobalt, 99%, cathode $12.50
Gold per troy oz. $434.00
Indium, dollars per troy oz. ..... $2.85-$4.00
Iridium, dollars per troy oz. $600
Magnesium sticks, 10,000 lbs. $1.91
Mercury, per 76-lb. f.o.b. N.Y. ..$365-$385
Molybdenum, lb. tech. moly oxides, 20 lb. MO can $5.85
Nickel oxide sinter at U.S. points of entry $3.12
Palladium, per troy oz. $140
Platinum, per troy oz. $475
Rhodium, per troy oz. $600.00
Silver ingots, per troy oz. $9.64
Vanadium $4.94
Zirconium sponge ..... $12.00-$17.00
(Per lb. unless otherwise noted)

Straits Tin Price

(U.S. cents per lb, EX-SMELTER, based on daily market in Penang in Malaysian dollars per kilo.)

Nov. 22—558.12
Nov. 23—558.91
Nov. 24—559.70
Nov. 25—Holiday
Nov. 26—559.44

Scrap Prices

Brass Mill Scrap

(Cents per lb; over 20,000 lbs. add 1¢ per lb)

	Solids	Turning
Copper	65½	56¼
Yellow brass	57⅞	52¾
Red brass	61¼	54¾
Comm. bronze	62¼	55¼
Mang. bronze	57¾	56
Free cutting rod ends	44	43

Custom Smelters Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	55
No. 2 copper wire	49
Light copper	39

Ingot Makers Scrap

(Cents per lb., carload lots, del. refinery)

No. 1 copper wire	51
No. 2 copper wire	45
Light copper	35
No. 1 composition	50
No. 1 comp. turnings	47
Hvy. yellow brass solids	33
Hvy. yellow brass turnings	26
Radiators	41

Aluminum

New mixed clips	24	—25
Old sheet	23	—24
Old cast	23	—24
Clean dry borings	23	—24

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Aluminum

Segregated clippings	22	—23
Mixed L.C. clips	20	—21
Old sheets and cast	14	—15
Borings and turnings	10	—11
Duraluminum clippings	20	—21

Copper and Brass

No. 1 copper wire	46	—47
No. 2 copper wire	39	—40
Light copper	34	—35
Radiators	32	—33
No. 1 composition	41	—42
No. 1 composition turn'gs	39	—40
Cocks and faucets	28	—29
Clean heavy yellow brass	26	—27
Brass Pipe	28	—29
New soft brass clippings	34	—35

Lead

Heavy soft lead	10	—11
Whole batteries	5	— 6
Type metal	15	—16
Electrotype	18	—19

Nickel

Nickel solids	110	—115
Nickel rod ends	110	—115
Nickel sheets, clips	110	—115
Nickel turnings	50	— 55

Zinc

New zinc clippings	14	—15
Old diecast zinc	7	— 8

MATERIALS NEWSFRONT

(Effective November 29, 1982) Prices obtained in trade based on representative tonnages per gross ton delivered to consumer unless otherwise stated. Prices are the opinions of *Iron Age* editors and correspondents, based on contacts with dealers, brokers, generators and users in the industry on the effective date listed above.

Ferrous Scrap Prices

Pittsburgh

No. 1 hvy. melting	$ 52.00 to $ 53.00
No. 2 hvy. melting	45.00 to 46.00
No. 1 dealer bundles	65.00 to 66.00
No. 1 factory bundles (auto)	58.00 to 59.00
No. 2 bundles	37.00 to 38.00
No. 1 busheling	58.00 to 59.00
Machine shop turn.	6.00 to 7.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	18.00 to 19.00
Low phos. punchings plate	67.00 to 68.00
Heavy turnings	45.00 to 46.00
No. 1 RR hvy. melting	64.00 to 65.00
Rails 2 ft. and under	76.00 to 77.00
Scrap rails, random lgth.	73.00 to 74.00
RR specialties	65.00 to 66.00
No. 1 machinery cast	61.00 to 62.00
Cupola cast	54.00 to 55.00
Heavy breakable cast	30.00 to 31.00
Stainless	
18-8 bundles and solids	420.00 to 425.00
18-8 turnings	320.00 to 325.00

Chicago

No. 1 hvy. melting	$ 46.00 to $ 47.00
No. 2 hvy. melting	42.00 to 43.00
No. 1 dealer bundles	56.00 to 57.00
No. 1 factory bundles (auto)	60.00 to 61.00
No. 2 dealer bundles	38.00 to 39.00
No. 1 busheling	56.00 to 57.00
Shredder scrap	56.00 to 57.00
Machine shop turn.	14.00 to 15.00
Mixed bor. and turn.	15.00 to 16.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	32.00 to 33.00
Low phos. forge crop	74.00 to 75.00
Low phos. punchings plate ¼ in. and heavier	78.00 to 79.00
Low phos. 2 ft. and under	73.00 to 74.00
No. 1 RR hvy. melting	48.00 to 49.00
Scrap rails, random lgth.	47.00 to 48.00
Reroller rails	85.00 to 86.00
Rails, 2 ft. and under	74.00 to 75.00
RR couplers and knuckles	69.00 to 70.00
RR car axles	102.00 to 103.00
No. 1 machinery cast	103.00 to 104.00
Cupola cast	89.00 to 90.00
Stove plate	76.00 to 77.00
Steel car wheels	57.00 to 58.00
Stainless	
18-8 bundles and solids	390.00 to 400.00
18-8 turnings	290.00 to 300.00
430 bundles and solids	90.00 to 95.00
430 turnings	65.00 to 70.00

Philadelphia

No. 1 hvy. melting	$ 53.00 to $ 56.00
No. 2 hvy. melting	48.00 to 51.00
No. 1 dealer bundles	65.00 to 68.00
No. 2 dealer bundles	38.00 to 41.00
No. 1 busheling	65.00 to 68.00
Shredder scrap	71.00 to 74.00
Machine shop turn.	18.00 to 21.00
Mixed bor. and turn.	18.00 to 21.00
Shoveling turnings	30.00 to 33.00
Clean cast chemical borings	40.00 to 43.00
Low phos. 5 ft. and under	60.00 to 63.00
Low phos. 2 ft. punchings	85.00 to 88.00
Electric furnace bundles	75.00 to 79.00
RR specialties	74.00 to 77.00
Rails, 2 ft. and under	89.00 to 92.00
Cupola cast	55.00 to 58.00
Heavy breakable cast	53.00 to 56.00
No. 1 machinery cast	97.00 to 100.00

Detroit

Broker buying prices per gross ton on cars:

No. 1 hvy. melting	$ 36.00 to $ 37.00
No. 2 hvy. melting	34.00 to 35.00
No. 1 dealer bundles	41.00 to 42.00
No. 2 bundles	18.00 to 19.00
No. 1 busheling	40.00 to 41.00
Drop forge flashings	21.00 to 22.00
Machine shop turn.	14.00 to 15.00
Mixed borings and turn.	7.00 to 8.00
Shoveling turnings	14.00 to 15.00
Cast iron borings	5.00 to 6.00
Heavy breakable cast	24.00 to 25.00
Mixed cupola cast	40.00 to 41.00
Automobile cast	58.00 to 59.00
Stainless	
18-8 bundles and solids	395.00 to 405.00
18-8 turnings	285.00 to 295.00
430 bundles and solids	70.00 to 80.00

Youngstown

No. 1 hvy. melting	$ 45.00 to $ 46.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 dealer bundles	51.00 to 52.00
No. 2 dealer bundles	30.00 to 31.00
Machine shop turn.	2.00 to 3.00
Shoveling turnings	8.00 to 9.00
Low phos. plate	52.00 to 53.00
Electric furnace bundles	52.00 to 53.00
Galvanized bundles	42.00 to 43.00

Cleveland

No. 1 hvy. melting	$ 42.00 to $ 43.00
No. 2 hvy. melting	24.00 to 25.00
No. 1 dealer bundles	46.00 to 47.00
No. 1 factory bundles	51.00 to 52.00
No. 2 bundles	22.00 to 23.00
No. 1 busheling	47.00 to 48.00
Machine shop turn.	2.00 to 3.00
Mixed bor. and turn.	2.00 to 3.00
Shoveling turnings	5.00 to 6.00
Cast iron borings	5.00 to 6.00
Cut structural & plates, 2 ft. and under	68.00 to 69.00
Low phos. punchings plate	68.00 to 69.00
Drop forge flashings	33.00 to 34.00
Foundry steel, 2 ft. & under	59.00 to 60.00
No. 1 RR hvy melting	63.00 to 64.00
Rails, 2 ft. and under	82.00 to 83.00
Rails, 18 in. and under	83.00 to 84.00
Steel axle turnings	69.00 to 70.00
Railroad cast	82.00 to 83.00
No. 1 machinery cast	79.00 to 80.00
Cupola cast	62.00 to 63.00
Stove plate	47.00 to 48.00
Stainless	
18-8 bundles	375.00 to 385.00
18-8 turnings	295.00 to 305.00
430 bundles	75.00 to 85.00

Buffalo

No. 1 hvy. melting	$ 25.00 to $ 26.00
No. 2 hvy. melting	15.00 to 16.00
No. 1 busheling	30.00 to 31.00
No. 1 dealer bundles	28.00 to 29.00
No. 2 bundles	12.00 to 13.00
Machine shop turn.	1.00 to 2.00
Mixed bor. and turn.	8.00 to 9.00
Shoveling turnings	10.00 to 11.00
Cast iron borings	8.00 to 9.00
Low phos. plate	48.00 to 49.00
Structural and plate, 2 ft. and under	46.00 to 47.00
Rails, 2 ft. and under	42.00 to 43.00
Scrap rails, random lgth.	22.00 to 23.00
No. 1 machinery cast	63.00 to 64.00
No. 1 cupola cast	42.00 to 43.00

St. Louis

No. 1 hvy. melting	$ 47.00 to $ 48.00
No. 2 hvy. melting	39.00 to 40.00
Foundry steel, 2 ft.	39.00 to 40.00
No. 1 dealer bundles	47.00 to 48.00
No. 2 bundles	36.00 to 37.00
Machine shop turn.	12.00 to 13.00
Shoveling turnings	18.00 to 19.00
Cast iron borings	30.00 to 31.00
No. 1 RR hvy. melting	47.00 to 48.00
Rails, random length	49.00 to 50.00
Rails, 18 in. and under	64.00 to 65.00
RR specialties	80.00 to 81.00
Cupola cast	70.00 to 71.00
Heavy breakable cast	48.00 to 49.00
Stove plate	70.00 to 71.00
Cast iron car wheels	49.00 to 50.00
Rerolling rails	84.00 to 85.00
Unstripped motor blocks	55.00 to 56.00

Birmingham

No. 1 heavy melting	$ 54.00 to $ 55.00
No. 2 heavy melting	52.00 to 53.00
No. 1 dealer bundles	54.00 to 55.00
No. 2 bundles	43.00 to 44.00
No. 1 busheling	54.00 to 55.00
Shredder scrap	72.00 to 73.00
Machine shop. turn.	18.00 to 19.00
Shoveling turnings	25.00 to 26.00
Cast iron borings	26.00 to 27.00
Electric furnace bundles	51.00 to 52.00
Elec. furnace, 3 ft. & under	52.00 to 53.00
Structural and plate, 2 ft.	70.00 to 71.00
Structural and plate, 4 ft.	65.00 to 66.00
No. 1 RR hvy. melting	54.00 to 55.00
Scrap rails, random lgth.	57.00 to 58.00
Rails, 18 in. and under	74.00 to 75.00
Angles and splice bars	65.00 to 66.00
No. 1 cupola cast	74.00 to 75.00
Unstripped motor blocks	52.00 to 53.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 27.00 to $ 28.00
No. 2 hvy. melting	26.00 to 27.00
No. 1 dealer bundles	28.00 to 29.00
No. 2 bundles	14.00 to 15.00
Machine shop turn.	1.00 to 2.00
Shoveling turnings	3.00 to 4.00
Cast iron borings	4.00 to 5.00
Low phos. 18 in. and under	52.00 to 53.00
Rails, random length	34.00 to 35.00
Rails, 2 ft. and under	59.00 to 60.00
No. 1 cupola cast	44.00 to 45.00
Heavy breakable cast	20.00 to 21.00
Drop broken cast	59.00 to 60.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 26.00 to $ 27.00
No. 2 hvy. melting	22.00 to 24.00
No. 2 dealer bundles	22.00 to 23.00
Mixed bor. and turn.	7.00 to 8.00
Machine shop turn.	4.00 to 5.00
Shoveling turnings	10.00 to 12.00
Clean cast. chem. borings	34.00 to 35.00
No. 1 machinery cast	89.00 to 90.00
Mixed yard cast	38.00 to 39.00
Heavy breakable cast	14.00 to 15.00
Stainless	
18-8 prepared solids	400.00 to 425.00
18-8 turnings	350.00 to 375.00
430 prepared solids	90.00 to 100.00
410 solids	80.00 to 90.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 28.00 to $ 30.00
No. 2 hvy. melting	20.00 to 22.00
No. 1 dealer bundles	28.00 to 30.00
No. 2 bundles	16.00 to 18.00
No. 1 busheling	28.00 to 30.00
Shredder scrap	36.00 to 40.00
Machine shop turn.	1.00 to 2.00
Shoveling turnings	1.00 to 2.00
No. 1 machinery cast	100.00 to 105.00
Mixed cupola cast	23.00 to 25.00
Heavy breakable cast	4.00 to 6.00

San Francisco

No. 1 hvy. melting	$ 39.00 to $ 41.00
No. 2 hvy. melting	31.00 to 33.00
No. 1 dealer bundles	26.00 to 28.00
No. 2 dealer bundles	11.00 to 13.00
Machine shop turn.	4.00 to 6.00
Cast iron borings	4.00 to 6.00
No. 1 cupola cast	83.00 to 85.00

Los Angeles

No. 1 hvy. melting	$ 38.00 to $ 40.00
No. 2 hvy. melting	27.00 to 29.00
No. 1 dealer bundles	25.00 to 27.00
No. 2 dealer bundles	8.00 to 10.00
Machine shop turn.	4.00 to 6.00
Shoveling turnings	8.00 to 10.00
Cast iron borings	4.00 to 6.00
Elec. furnace, 1 ft. and under (foundry)	84.00 to 86.00
No. 1 cupola cast	86.00 to 88.00

Seattle

No. 1 hvy. melting	$ 53.00 to $ 55.00
No. 2 hvy. melting	42.00 to 44.00
No. 2 bundles	32.00 to 34.00
No. 1 cupola cast	88.00 to 90.00
Mixed yard cast	78.00 to 80.00

Hamilton, Ont.

Brokers buying price per net ton on cars:

No. 1 heavy melting	$ 33.00
No. 2 heavy melting cut 2 ft. and under	30.00
No. 1 dealer bundles	40.00
No. 2 bundles	5.00
Mixed steel scrap	17.00
Bush. new fact. prep'd.	38.00
Bush. new fact. unprp'd.	30.00
Machine shop turn.	16.00
Short steel turn.	21.00
Mixed bor. and turn.	10.00
Cast scrap	30.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$ 50.00 to $ 51.00
No. 2 hvy. melting	38.00 to 39.00
No. 2 bundles	28.00 to 30.00
Machine shop turn.	8.00 to 9.00
Crushed turnings	22.00 to 24.00
Shredder scrap	50.00 to 51.00
Cut structural plate 2 ft. and under	72.00 to 74.00
Unstripped motor blocks	55.00 to 57.00
Cupola cast	64.00 to 66.00

STEEL PRICES

Codes identify Producers listed in the Key on page 97. (Prices quoted are mill base prices in cents per pound unless otherwise noted and do not reflect extras or surcharges.) N.A.—Not available.

Billets, Blooms, Slabs

(Dollars per net ton)

Carbon Rerolling, Midwest	
W5	$366.00
N4	$366.00
West	
C6	$346.00
Carbon Forging, East	
B3(3), C10	$420.00
R3	$420.00
Midwest	
R3, U1, W5	$420.00
S1	$420.00
C10	$420.00
K2	$400.00
W5	$400.00
West	
B3(2)	$430.00
C6	$420.00
South	
A7	$420.00
Alloy, East	
R3, C10	$459.00
B3	$459.00
Midwest	
W8, W5, C10	$459.00
S1, U1	$459.00
R3	$459.00
We	
B3	$469.00
C6	$469.00
South	
A7	$436.00

Piling Sheet Steel

(cents per lb)

Midwest	
U1	26.45

Structurals

Carbon, East	
B3(2)	23.90
U1, J3	23.90
Midwest	
A7	24.15
C20	22.90
W8	22.90
I3, T10, U1, N4	23.90
West	
C6	25.10
U1	24.40
B3(2)	21.65
South	
C16, U1	23.90
T10	22.90
A8	Cmp*
High-Strength, Low Alloy, East	
B3(2)	23.90
U1, J3	23.90
Midwest	
N4	23.90
W8	24.15
U1	23.90
I3	23.90
West	
U1, A7	24.40
B3(2)	21.65
South	
U1, C16	23.90
Wide Flange, Carbon, East	
B3	23.90
U1, A7, J3	23.90
Midwest	
U1	23.90
N4	23.90
I3	23.90
West	
U1	24.40
C6	24.15
South	
A7	24.15

Strip

Hot-Rolled, Carbon, Cut ll Edge—all widths, East	
B3, U1	20.80
J3	20.80
Midwest	
A7, D1	20.80
I4	20.20
S1, J3, D1	20.80
W3	20.80
N4	22.55
W5	20.80
U1	20.80
B3, G2, I3, M2, R3, J3, G3	20.80
West	
K1	20.80
B3	24.70
South	
R3	20.80
Cold-Rolled, Carbon Max. 25%, East	
E4	29.75
R7, S10, B4	29.60
P15	24.80
S7	Cmp*
U1	33.25
D1(1)	Cmp*
B4	31.55
Midwest	
G4	24.80
I4	30.15
W14	22.95
S1, U1, J3	32.00
T4	Cmp*

*Composite pricing

West	
U1	33.25
High-Strength, Hot-Rolled, Low Alloy, Cut Edge & Mill Edge—all widths, East (plus extras)*	
Midwest	
M2, G3, R3, W3, I4, J3, G2, I3	20.80
A7	20.80
S1	20.80
West	
K1	20.80
South	
R3	20.80
High-Strength, Cold-Rolled, Low Alloy, Mill Edge, East	
R7	29.00
Midwest	
S1	32.00
Alloy, Hot-Rolled, Midwest (plus extras)*	
S1	23.20
G4	25.80
I4	22.70
Alloy, Cold-Rolled, East	
C11, E4, M8	43.35
R7	32.75
B4	42.60
P15	32.10
S1	39.90
Midwest	
I4	39.40
S1	37.65

Sheets

Hot-Rolled, Carbon (18 Ga & Hvyr), East	
B3	20.80
J3	20.80
U1	20.80
Midwest	
A7, U1, B3, G2, G3, I3, M2, R3, W3	20.80
S1, W5, D1	20.80
J3	20.80
I4	19.90*
West	
U1	21.30
K1	20.80
South	
R3	20.80
Cold-Rolled, East, Class I	
B3(2), U1	24.65
J3	24.65
Midwest	
B3, I3, G3, R3, M2, U1(2)	24.65
G2, W3, M11	24.65
I4	22.00
J3, A7	24.65
S1, W5, D1	24.65
West	
U1	25.15
South	
R3	24.65
Galvanized (hot-dipped), East	
B3(2)	26.25
Midwest	
J3, D1	26.25
I3, W5, S1	26.25
U1, A7, R3, Y1	26.25
G2, W3, M11	26.25
West	
K1	27.15
South	
U1	26.25
R3	26.25
Enameling, Midwest	
A7, I3, U1, J3	26.15
S1	26.50
Long-Terne, Midwest	
W5	28.30
A7, U1	27.60
R3	27.60

*Actual weight basis

Wire Rod

East	
B3(2)	22.35
U1	22.35
Midwest	
N4	22.35
U1, K2	22.35
West	
A7	22.00
C6	21.45
B3	23.25
South	
G7	22.35

Tinplate

Electrolytic Tinplate

	per base box
Single Reduced (70 lb)	
East	
B3, J3	$26.29
U1	26.29
Midwest	
B3	$26.29
U1	26.29
J3 (75 lb)	26.29
M11	26.29
W3	26.29
W5	26.29
West	
K1	$25.44
U1	26.79
South	
U1	$26.29
Double Reduced (55 lb)	
Midwest	
M11 (50 lb)	$21.49
B3, J3	21.49
U1	21.49
W3	21.49
W5	21.49
West	
K1	$20.39
U1	21.99
South	
U1	$21.49
Black Plate	
Single Reduced (75 lb)	
East	
B3	$23.36
Midwest	
J3	$23.36
M11	24.01
I3, U1, W5	23.36
W3	24.01
West	
K1	$24.01
U1	23.36
Double Reduced (55 lb)	
East	
B3	$18.93
Midwest	
M11	$18.93
W5, U1	18.93
J3	18.93
W3	18.93
W5	18.93
West	
U1	$18.93
South	
U1	$18.93

**70 lb—base weight extra 45¢
***50 lb—base weight extra $1.40

Bars

Carbon Steel, Hot-Rolled (Special quality)	
East	
R3, K3	23.95
R5	23.95
B3(3), J3	23.95
U1, C10	23.95
Midwest	
A7, C20, N4	23.95
U1, I3, I4	23.95
R3, T10	23.95
K2	23.95
I3	19.50*
West	
B3	23.95
C6	24.45
U1	23.95
B3	24.70
South	
A8	20.65
A7	23.95
C16	23.95
Cold-Finished Carbon, East	
A11	22.15
J3(2)	31.50
R3	31.50
C21	21.15
J3, L2	31.00
C2	23.025
M8, W10, T11, S8	31.00
N1	24.475
R4	22.25
B4	31.00
M1	23.025
B4, C10	31.00
J3	31.50
Midwest	
B5, W10, Y1, W8, R3	31.00
J3	32.15
B1	19.80
L2	30.75
N9	31.00
P3	19.85+CMS
W14	22.20
J3(3)	31.00
B5	31.25
J3	32.15
West	
B5	31.20
B5	34.90
R3	31.20-34.90
South	
B5	32.85
J3	31.95
C16	24.40
J3	31.95
Alloy, Hot-Rolled, East	
B3(2), R5, K3, C10	26.10
R3	26.10
J3	26.10
Midwest	
A7, U1, R3	26.10
I3, C10	26.10
I4	24.85
I3	21.00*
West	
B3, U1	26.10
B5	18.50
C6	26.60
B3	27.10
South	
A7	24.85
A8	22.00
Alloy, Cold Drawn, East	
L2	35.20
R3, N1, C2	35.40
M1	28.025
R4	25.65
A11	30.50
J3, W10, L2	34.85
T11, S8	34.85
C10	34.85
J3(2)	35.40
Midwest	
B5, R3, C10	34.85
C2	28.275
J3, M9, W10	35.40
P3	22.75
B1	22.70
N9	34.85
L2	34.65
B5	35.10
J3	36.00
J3	34.85
West	
R3	35.20-38.25
B5	35.20
B5	38.25
South	
J3	35.40
C16	28.00
B5	36.75

Plates

Carbon Steel, East	
B3(2)	24.25
L4	24.25
P2	24.25
U1	24.25
J3	25.25
Midwest	
B3, G3, R3, G2, S1	24.25
I3	24.25
J3, A7	21.70
U1, I4	24.25
West	
A7, B3, C6, O2	24.25
K1	23.50
U1	24.25
South	
R3	24.25
A7	25.25
U1	24.25
Alloy, East	
B3, J3	32.05
U1, L4	32.05
P2	32.05
Midwest	
B3	32.05
G2, G3	32.05
I4, U1	33.05
West	
B5	32.05
O2	30.55
K1	31.30
South	
A7	27.55

Wire

Carbon Steel Wire, East	
B3(2)	27.10
U1	27.70
A11	22.15
Midwest	
U1	27.70
A7, R3	24.60
N4, W7	27.40
K2	24.20
South	
A8	22.85
West	
A7	25.95
C6	24.95

STEEL PRICES

Producer Key
With Principal Offices

A4 American Cladmetals Co., Carnegie, Pa.
A7 Armco Inc., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A11 Atlantic Wire Co., Branford, Conn.

B1 Baron Drawn Steel Corp., Toledo, Ohio
B3 Bethlehem Steel Corp., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin Steel Co., Harvey, Ill.

C1 Calstrip Corp., Los Angeles
C6 CF&I Steel Corp., Pueblo, Colo.
C10 Copperweld Steel Co., Warren, Ohio
C11 Crucible Divisions, Colt Industries, Pittsburgh, Pa.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Co., Birmingham, Ala.
C20 Calumet Steel Div., Chicago Heights, Ill.
C21 Cumberland Steel Co., Cumberland, Md.

D1 Detroit Strip Div., Cyclops Corp.
D2 Driver Wilber B., Co., Newark, N. J.
D3 Driver Harris Co., Harrison, N. J.

E3 Enamel Products & Plating Co., McKeesport, Pa.
E4 Elliot Bros. Steel Co., New Castle, Pa.

F1 Firth Sterling, Inc., McKeesport, Pa.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Division, National Steel Corp., Ecorse, Mich.
G4 Greer Steel Co., Dover, O.
G5 Green River Steel Corp., Owensboro, Ky.
G6 Gibraltar Steel Corp., Buffalo, N. Y.
G7 Georgetown Steel Corp., Georgetown, S. C.
G8 Guteri Special Steel Corp.

H1 Hercules Drawn Steel Corp., Livonia, Mich.

I2 Ingersoll Steel Div., New Castle, Ind.
I3 Inland Steel Co., Chicago, Ill.
I4 Interlake Steel Corp., Chicago

J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Calif
K2 Keystone Consolidated Industries, Inc.
K3 Kentucky Electric Steel Co., Ashland, Kentucky
K5 Kemco Div., Foote Mineral Co., Keokuk, Iowa

L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.
L5 Litho-Strip Corp., Chicago

M2 McLouth Steel Corp., Detroit
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M8 Mill Strip Products Div., National Steel Service Center, National Steel Corp.
M9 Moltrup Steel Products Co., Beaver Falls, Pa.
M11 Midwest Steel Div., National Steel Corp., Portage, Ind.

N1 Northeast Precision Steel Co., Boston, Mass.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N8 Northwest Steel Rolling Mills, Seattle, Wash.
N9 Nelsen Steel & Wire Co., Chicago, Ill.
N10 North Star Steel Co., Saint Paul, Minnesota

O2 Oregon Steel Mills, Portland, Ore.

P2 Phoenix Steel Corp., Claymont, Del.
P3 Wyckoff Steel Div., Plymouth, Mich.
P9 Pacific States Steel Co., Niles, Cal
P13 Penn Dixie Steel Corp., Kokomo, Ind.
P14 Pacific Tube Co., Los Angeles
P15 Philadelphia Steel and Wire Corp., Phila.

R3 Republic Steel Corp., Cleveland
R4 Ramco Steel Co., Buffalo, N. Y.
R5 Roblin Steel Corp., Inc., North Tonawanda, N. Y.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S10 Seneca Steel Service, Buffalo, N. Y.
S16 Southern Precision Steel Co., Gulfport, Miss.

T4 Thomas Steel Strip Co., Warren, O.
T5 Timken Company, Steel Division, Canton, O.
T7 Texas Steel Co., Fort Worth, Tex.
T9 Triumph Electro Corp., Chicago, Ill.
T10 Tennessee Forging Steel Corp., Harriman, Tenn.
T11 Teledyne Columbia-Summerill, Carnegie, Pa.

U1 United States Steel Corp., Pittsburgh, Pa.

W3 Weirton Steel Division, National Steel Corp., Weirton, West Va.
W5 Wheeling-Pittsburgh Steel Corp.
W7 Wilson Steel & Wire Co., Chicago
W10 Wyckoff Steel Div., Ampco-Pittsburgh Corp., Pittsburgh, Pa.
W14 Whittaker Steel Strip Div., Detroit, Mich.

Steel Service Center Prices

Price, Dollars per 100 lb

Cities* / City Delivery Charge*	Sheets			Strip	Plates	Shapes	Bars		Alloy Bars			
	Hot-Rolled (10 gage)	Cold-Rolled (20 gage)	Galvanized (16 gage)	Hot-Rolled Strip	Plates	Standard Structurals	Hot-Rolled (merchant)	Cold Finished	Hot-Rolled 8620 As Rolled	Hot-Rolled 4140 Annealed	Cold-Drawn 8620 As Rolled	Cold-Drawn 4140 Annealed
Atlanta	25.04	29.02	33.66	34.17	29.52	31.46	20.27	39.93	42.10	52.60	69.58	73.19
Baltimore	32.25	36.51	42.48	42.85	35.56	37.48	22.17	47.70	55.85	59.91	67.79	76.32
Birmingham	25.90	30.24	36.47	35.03	29.67	31.68	21.36	42.09	49.31	50.41	68.16	74.43
Boston	23.43	28.25	31.93	44.27	37.43	37.68	21.80	47.75	57.60	60.66	68.49	75.74
Buffalo	27.75	34.41	36.35	43.01	35.20	32.46	18.26	45.85	54.11	55.64	62.09	70.72
Chicago	20.66	27.56	29.92	28.38	27.89	27.59	15.85	37.90	36.36	45.80	52.34	58.53
Cincinnati	21.18	28.39	33.39	33.39	28.93	32.06	17.72	37.94	36.07	45.12	51.63	55.79
Cleveland	28.24	31.54	33.44	31.13	28.63	31.81	17.45	42.44	39.27	49.22	55.16	61.24
Denver	32.69	38.65	38.66	42.32	36.91	38.18	22.79	49.35	56.13	65.40	72.50	81.22
Detroit	22.66	31.48	32.73	33.22	28.59	23.84	17.16	38.14	36.36	42.15	50.79	56.90
Houston	23.83	28.28	32.53	41.35	34.12	37.90	17.16	38.14	36.36	42.15	50.79	56.90
Kansas City	23.37	27.16	31.59	30.36	30.20	35.62	17.37	43.29	41.88	50.92	56.17	63.93
Los Angeles	30.02	38.03	39.14	45.66	37.13	38.95	33.49	50.38	62.24	72.33	77.74	89.22
Memphis	31.11	31.16	35.27	37.84	31.07	33.84	32.34	39.82	52.82	56.96	67.85	77.44
Milwaukee	21.60	28.47	30.74	30.92	30.45	30.42	16.02	38.52	36.88	47.20	52.71	59.02
New York	22.00	26.53	30.70	42.40	31.67	32.93	20.83	48.87	50.98	59.83	68.45	75.35
Philadelphia	28.57	34.80	37.22	44.85	33.40	37.64	22.07	47.16	51.67	58.71	67.13	74.37
Pittsburgh	23.85	28.39	32.99	40.86	36.80	22.09	21.35	43.55	48.95	59.88	66.19	72.84
Portland	32.04	37.16	41.51	33.10	34.82	38.20	53.64	56.85	61.00	64.10	66.10	....
San Francisco	29.27	35.77	39.71	45.05	38.70	39.18	31.92	51.14	62.56	71.65	77.93	86.10
Seattle	29.85	35.14	37.68	48.76	32.89	35.32	29.86	51.38	64.02	70.14	73.83	87.67
Spokane	21.08	30.56	33.56	36.69	35.18	25.16	20.32	41.00	42.02	46.30	....	58.32
St. Louis	24.60	29.12	32.77	36.50	28.14	32.45	18.68	42.59	43.13	51.08	58.11	63.64
St. Paul	23.43	27.76	32.10	35.20	29.31	32.38	16.87	43.07	39.20	48.63	51.53	60.75

Base Quantities. All HR products may be combined for quantity. Hot-rolled sheet, 10 ga x 36 x 96—120; Cold-rolled sheet, 20 ga x 36 x 120; Galv. sheet—16 ga x 36—120; Hot-rolled strip—⅛" x 1"; Plate ¼" x 84/; Shapes—I-Beams 6 x 12.5; Hot-rolled bar—Rounds ¾-$2^{15}/_{16}$; Cold finished bar—C 1018—1" rounds; Alloy bar—Hot-rolled 8620—1⅝" round; Cold drawn—1" round; Hot-rolled 4140—1⅝" round; Cold drawn—1" round. Check local supplier for additions or deductions from base.

*Prices at all points include metropolitan delivery charges.

METALWORKING PRICE TRENDS

Disinflation seems to be settling down for a long stay

During a warm November, prices of metalworking products were cool. The reason: Market demand for the products was not too hot.

That about tells it all for prices these days. The recession rolls on and prices cool down.

Lately, some of the metalworking products listed on the table here have been showing no month-to-month price changes at all—or even declines.

In November, for example, prices of eight of the 22 listed products were unchanged from October; four product lines showed actual price slides.

The latest price rise for the listed products came to 0.6 pct in November. That comes out to a bit more than 6 pct on an annual basis.

A better price trend perspective is seen in November prices compared to a year ago. In the case of all producer finished goods, the U.S. Labor Dept. noted that the year-to-year price advance came to 3.7 pct. For capital equipment, the price rise was 4 pct. The overall metalworking product price advance was close to that for capital equipment.

Most of the push in November producer goods prices came from hikes for natural gas, home heating oil and gasoline. But price analysts view these rises as temporary surges. In fact, since the November price report was issued, prices for these energy goods have given ground.

The strongest November price advance for the products listed on the table here was seen for electric motors. But even for this product line, the advance was nothing like the hikes of 1.7 pct and 1.5 pct made in earlier months of the year.

The disinflating economy is creating real problems for many companies. Where many companies used to hike price tags to keep profits up, many are now just trying to hold firm on their prices in hopes of preventing, or minimizing, losses.

Relief for these companies may be a long way off. Just about all economists see a modest recovery for next year and a continuation of recent productivity gains. These things add up to decreased inflationary expectations for 1983.

On top of these signs pointing to continued disinflation, is the special market weakness in capital goods. This, too, points to continued price softness for many metalworking product lines.

Latest Month Covered: November, 1982

Products	Index Reading For Month (1967 = 100)	Pct Change From Previous Month	Pct Change From Year-Ago Month
Metal Cutting Machine Tools	373.1	0	+ 4.7
Metal Forming Machine Tools	411.5	+ 0.2	+ 6.1
Agricultural Machinery & Equip.	318.1	+ 0.3	+ 5.8
Construction Machinery & Equip.	347.8	+ 0.3	+ 5.5
Industrial Process Furnace & Ovens	356.1	0	+ 5.0
Industrial Material Handling Equip.	286.3	+ 0.2	+ 0.7
Pumps, Compressors & Allied Equip.	348.0	+ 0.1	+ 3.6
Fluid Power Equip. (Dec. 1970 = 100)	247.2	0	+ 8.3
Mechanical Power Transmission Equip.	311.4	+ 0.1	+ 2.4
Automobiles	218.4	− 0.5	+ 2.0
Motor Trucks—Light	274.0	0	+ 1.6
Motor Trucks—Heavy	317.4	0	+ 7.6
Railroad Equipment	357.5	0	+ 4.7
Fabricated Metal Structural Products	302.8	− 0.3	− 0.1
Electric Motors	293.1	+ 0.7	+ 1.2
Valves & Fittings	322.7	+ 0.1	+ 1.7
Ball & Roller Bearings	335.3	0	+ 4.3
Cutting Tools & Accessories	271.9	0	+ 3.8
Heating Equipment	238.9	+ 0.1	+ 4.4
Plumbing Fixtures & Brass Fittings	278.2	+ 0.1	+ 1.9
Metal Containers	327.0	− 0.5	+ 2.8
Miscellaneous Metal Products	288.5	− 0.4	+ 3.8

Data based on U.S. Labor Dept.'s Producer Price Index